Overstrand Church, Norfolk, before Restoration.

# THE REPAIR OF ANCIENT BUILDINGS.

By W. A. Forsyth [*F.*].

**Read before the Royal Institute of British Architects, Monday, 15th December 1913.**

THE repair of ancient buildings is one of the most important and one of the most difficult of the many duties which architects are called upon to undertake. The subject has claimed the attention of this Royal Institute from the early days of its incorporation, and, during the interval which has elapsed, the Council has given practical consideration from time to time to the many changes which have affected its general treatment. Recent legislation again brings the matter to our notice, and suggests that the time has arrived when further consideration should be given to what has become a national question and yet remains an unsettled problem in many of its broad principles.

In accepting the honour of the Council's invitation to lay before you some aspects of the subject I had some diffidence; as, although none could be found more enthusiastic towards the matter in hand, someone more qualified could with advantage have been chosen.

It is not proposed to review the history of the ideas and methods of preserving old buildings in this and other countries. This has but recently been undertaken in so remarkable yet comprehensive a manner by one of our members as to command the full admiration of all architects and others engaged in this important work. Mr. A. J. Davies's Prize Essay * stands as a monument to patient research and proportionate deduction. Nor is it possible to cover the whole ground of our subject in one evening.

It is not necessary to remind ourselves of the desirability of preserving works of past ages for their historic interest or æsthetic value; nor that it is imperative that we should study the methods whereby our ancestors adapted their structures to the demands of living or worship and to resist the destructive influences of the climate. That is an aspect upon which all are agreed, and it is the foundation upon which the subsequent consideration of the subject should be based.

* Journal R.I.B.A., 14th and 28th June 1913.

New legislation in this country is invariably the development of old laws. The recently passed Ancient Monuments Consolidation and Amendment Act is such a measure, and, although hastened by the scares of Transatlantic exports from Britain, is a cautious advance into the domain of private ownership in national monuments. The Act permits the purchase or acceptance by the Government of an historic monument, and provides for its upkeep. When a work of national importance is in a state of neglect, and decay is threatened, a preservation order can be applied for, and, under certain conditions, put in force. The Commissioners of Works then step in and effect necessary reparation.

The Act, by Section 12, imposes penalties of fine and imprisonment on owners who deface or alter a scheduled monument without sanction. Under Section 14, anyone injuring or defacing a monument which is the subject of a Preservation Order may be fined £5, and be ordered to pay the cost of repairing any damage he has caused. By Section 18, where the erection of buildings in harmony with other buildings of artistic merit is impeded by by-laws, such by-laws may be relaxed upon certain conditions.

Advisory Boards are to be appointed for England, for Scotland, and for Wales. Upon the first, the Royal Institute of British Architects is to have representation under the terms of the Act, and we are all glad to hear that our President has been nominated to represent our views.

It cannot be contended that British legislation has reached finality in this matter; yet it is hoped that the necessity will not arise for many years to come when cathedrals and churches in regular use shall come within the range of some authoritative preservation other than ecclesiastical. Some urgent organisation is needed, in order that the requirements of the clergy, who are but the temporary custodians of their churches, should be considered and their fulfilment supervised by some properly constituted authority. A diocesan scheme lends itself to this purpose, but the present procedure in the matters of granting faculties and supervising the performance of works is in need of amendment. The custom of giving to structural alterations or decorative additions a memorial character is one which impedes repair and alteration in ancient ecclesiastical buildings.

The Town Planning Act of our own time recognises ancient monuments: the realisation of a municipal lay-out may be affected by the position of an historic building. Here is a matter of congratulation to architects; but, having rescued a work of the past, it is important that any repairs be of such a nature as to secure the spirit of the early builders from destruction.

It may be said, however, that Continental countries have long passed more comprehensive and stringent laws governing the scheduling and preservation of ancient monuments than we possess: yet in many of those countries it will be generally agreed that the methods of repair or preservation have been proportionately drastic in their efforts to preserve the letter, rather than the spirit, of old work. Thus in France, where excellent laws exist for scheduling either the whole or part of a monument, one finds a big organisation at work upon a wholesale reconstruction of, say, a church. A huge brick wall is built to divide completely the east and west parts of the interior. Worship is conducted in one part while the renewal of sound, though uneven, early masonry is proceeding, with general repairs, on the other side of the temporary wall. Hoardings around the exterior enclose the masons' yards and their equipment. Restoration in its undiluted form is resorted to, and although it has the merit for the moment of being unmistakably distinguished by its newness, much unnecessary destruction has taken place in the process. Many of the churches and châteaux of France have lost interest by this means, and I venture to attribute it to the effects of the systems which obtain in Government and ecclesiastical organisations.

Signs are not wanting which suggest that a similar condition of affairs is liable to arise in

this country unless the lesson to be derived from Continental practice is learned and applied. Our own Government, through H.M. Office of Works and other departments, is doing splendid service in the preservation of ancient monuments. In the quality and spirit of the later work which I have been privileged to see, great praise is due to their advisers, and in this respect Mr. C. R. Peers, as Inspector of Ancient Monuments, is deserving of our full commendation. There are unmistakable signs, however, that by reason of the system of accounts, estimates, supervision, absence of personal responsibility, and other routine necessary to a Government Department, the buildings under treatment have been receiving too much repair. The personal element breaks down under this procedure, and the staff is unable to cope with the extraordinary number of works lying in the extreme boundaries of the kingdom.

The fundamental principle underlying the preservation of ancient work in this country is that independent and sufficient treatment is required for each example. Danger lies in placing in the hands of great Government or ecclesiastical bodies the care and maintenance of these varied remains of the arts of past ages. However well organised and administered, and however competent the authority may be, the effect of such system is liable to have injurious results upon those interests and values which we seek to conserve. The element of personal responsibility is sunk in the depths of departmental procedure. The system is proof against criticism and suggestion.

This aspect of our subject is especially important, in view of the operation of the recently enacted laws, whereby so many more old buildings in a state of disrepair are being handed over to official charge. The initial repair of these works is of the utmost importance, and no undue speed or want of supervision should attend them at this time.

Here, therefore, I venture to suggest, is a vital matter with which our Council should concern itself, and it is with full respect that I submit that we leave for a time some of those intricate problems affecting the welfare of architects, and turn to an affair of architecture having a national importance. Knowledge in this subject of repair cannot be acquired from a study of learned treatises, nor from a Paper of the kind to which you have kindly consented to listen. It can only be obtained by actual handling of the work. Much is to be gained by the examination of successful repairs at other buildings throughout the country, and here I venture, with some hesitation, upon another suggestion.

Opportunities should be taken of visiting houses or cathedrals which have emerged from the process of repair; such visits would be invaluable in helping to consolidate professional opinion. The Royal Institute has no tradition or custom in arranging visits to buildings, and I do not wish to add further labours to our excellent office staff. The policy of the Institute has been one of continual encouragement and recognition of the Allied Societies, and my proposal is that these provincial bodies be invited in turn to organise an annual visit to some important works in its area. My own impression is that many of the Allied Societies would respond favourably.

The survey of the Royal Commission is proceeding with all due care and with no undue despatch. The three volumes already issued are of great value, but our impatience for more would urge a decentralisation of the work of completing the survey. Although the subject-matter is governed by the date of 1700 A.D., an extension of that limit will be necessary in a new survey, which will be required a hundred years or so hence. Many authorities recommend, therefore, an expediting of the work. I think some improvement can be made in the method of preparing the scale drawings; these are all ruled, and this style of draughtsmanship prevents the accurate indication of uneven surfaces or parts, the record of which, drawn to scale by freehand methods, would be invaluable. Constructional and other details would be interesting as a means of comparing the craftsmanship of the various districts.

In 1865 the Royal Institute issued its well-known recommendations on the "Conservation of Ancient Monuments" and "Hints to Workmen." These were enlarged and revised in 1888, and form some of the most able and useful documents which we publish. The intervening period of twenty-five years which has elapsed has, I venture to think, produced a considerable change of thought upon some of the larger principles of the subject, and a further revision would appear to be desirable. It would form an excellent work for the Art Committee.

When revised the recommendations would make a useful addition to the curriculum of the Final Examination, not because it would fit the successful candidate for the work of superintending repairs to historic buildings, but that he would be made aware of the difficulties of this branch of our work. The candidate now emerges from the examination process equipped for a contest with a district surveyor or a sanitary inspector; but, should he have the honour of facing a parson and two churchwardens, or be called upon to direct the domestic problems of a millionaire, he will be singularly devoid of the ordinary weapons for the occasion.

Sutton-on-Trent Church, before Repairs.

As specimens of the revisions in the recommendations which the present attitude of architects especially engaged in this work appears to demand, I venture to submit the following observations:—

In the first clause it is recommended that a competent architect be consulted before any alteration is decided on. It will generally be admitted that such a course is also necessary in cases of repair.

The main principles are very sound, and show that great care was given to the original framing of the conditions, but the time has arrived when the term "restoration" should give place to an expression more consistent with the direct spirit of the recommendations.

Clauses 3 and 4, suggesting that neighbouring buildings of the same style should be examined in order that doubts may be cleared up as to the original design of any part of the building under treatment, should be eliminated. The principle of restoring missing or defaced features is one to be discouraged.

Again, the renewal of stone should, according to the suggestions (Clause 9), be of similar character. If it should by any chance replace work forming an essential part of a building, the stone should not be exactly similar, although sound, so that the repair may be clearly recorded. The same principles apply to the repair of brickwork. In both cases, stone and brick, the uses of roofing and other tiles are unlimited.

In the same clause there is the unfortunate advice of jacking up "without difficulty" a

sound wall which is out of plumb. It is not an infrequent case to find a church wall out of upright, and which has been so for centuries. Some authorities believe it to have been so originally built; but there are many walls having one face sloping and the other quite erect, which were undoubtedly so constructed, and probably for reasons of economy and effect. Jacking up is liable to set up defects from which a leaning wall is free. None of these sound walls should be touched.

Clause 10 offers two methods of constructing a new roof, and if we are to be truthful in our attitude to history, both are to be deprecated, and both conflict with the sound advice given in the "Hints to Workmen." The first is carefully to reproduce an old existing roof, or to erect a new roof of the same pitch as the original covering, "as evidenced by a dripstone on the tower walls." Both would be misleading a hundred years hence or less. Surely the right course to adopt is to erect a roof both sightly and sound, which shall not aim at misleading those who are engrossed in the study of ancient building.

SUTTON-ON-TRENT CHURCH, AFTER REPAIRS. Mr. Weir, architect.

Clause 11 puts into language unmistakable and convincing what is the right course to pursue. I quote it to show the necessity for removing some of the inconsistencies of our recommendations:—

"Ancient buildings will generally be found to have been altered at various periods; when this is the case the whole of the old work should be preserved and exposed to view, so as to show the history of the fabric, with its successive alterations, as distinctly as possible."

No. 15 leaves no doubt upon the subject:

"The duty, therefore, of all those having charge of ancient buildings should be not so much the renewal of what remains as its preservation; and this should embrace every portion of original work which it is in any way possible to save, for it must be remembered that new work is of no value or interest except so far as it serves to preserve the ancient design."

The lead sheets of an old roof can be recast and ancient glass releaded at the site, in order to avoid loss in transit and great expense in cartage.

The retention of fragments of old craftsmanship in the actual building is admirably stated in Clause 14, where it is laid down that the contractor shall be debarred from acquiring such objects. It should, I think, be added to include the vicar and the architect. Many an architect's office contains specimens of fine ancient carving!

When these and other inconsistencies are removed and extensions made the recommendations will perhaps be more in keeping with current opinion on this important subject, and fit

them better for the proud position claimed in Clause 17, as "embodying principles impossible to controvert."

WINGRAVE CHURCH, BUCKS, BEFORE RESTORATION

Coming to the valuable "Hints to Workmen" engaged on the repairs on ancient buildings, one finds that some slight amendment is desirable.

WINGRAVE CHURCH, BUCKS, AFTER RESTORATION.

Because whitewash exists on wall surfaces, the "Hints" appear to recommend its removal. Whitewash is an ancient process, and has acted as a great preservative of stone and other wall

facings. It should, therefore, be only interfered with when it is known to be of recent date, hiding some valuable paintings, and in cases when it is flaking. I do not think Manchester card is a desirable appliance for this process under any circumstances. A fine, flat knife, or spatula, is preferable.

I do not think it wise to countenance the reproduction of sections of mouldings with scrupulous accuracy; first, because it is inconsistent with our historic principle, and, secondly, an imitation of a weathered line is liable to fail in its intention.

The British mason is no great expert in copying a mediæval moulding, as one constantly sees in the Victorian restorations. Take, for instance, the simple section of a mullion: in cases where the original hollows were flat and but slightly removed from a chamfer or splay, it is a common occurrence to find that the imitated section is deeply hollowed. The former has the soft effect of quiet solidity, whilst the latter possesses a thin, cast-iron appearance.

Missing parts of mouldings can be repaired in many ways, provided that the spirit of the section, and not the accurate detail, be reproduced. The repair must be permitted to declare itself.

No new tile flooring should attempt to imitate old encaustic tiles.

The clause referring to Carver should be eliminated. It is seldom that new carving should enter into the preservation of an old building, and never that old carving should be touched, except, perhaps, for cleaning.

Some advice to bricklayers might, with advantage, be added, especially with regard to pointing. Grouting and other matters should be included, to which subjects reference is made later in this Paper.

## GENERAL ASPECTS OF REPAIRS.

The architect is consulted in order to determine the actual safety and probable endurance of an old building, so that steps may be taken to prolong its life. Everything should be maintained that is sound, and repaired that is weak, apart from all considerations of taste or fashion, and, in many cases, of convenience, in order to record the history or evolution of the building.

It is no great hardship to adapt current modes of living to the domestic limitations of a seventeenth-century dwelling. A mediæval church having served the needs of a community for six hundred years should require no structural change to meet any twentieth-century ideas in ritual or ceremony. But where enlargement is necessary to meet the growth of a congregation and maintain the uses of the fabric then let all extensions be honest and sympathetic and not imitative. Therefore, all reparation should be directed to the maintenance and continuance of the historical account. Repairs and renewals are part of that story, and should be self-expressive. Pressure is frequently brought to bear by employers or by promoters upon their advisers; but a rigid adherence to this general principle will save many an ancient monument from a process of falsification which may never thereafter be detected. The importation of all ancient fittings or features to the building under repair should be discouraged. When unavoidable some documentary or other record should be made.

It is the proud boast of certain architects and builders that their new work cannot be distinguished from the old. This is an unfortunate principle, as, although a harsh note may thereby be avoided by this precise imitation, nevertheless distinctive methods may be yet employed which are both sympathetic and sound.

As diagnosis is the basis of a doctor's work, so is survey the important function of an architect engaged to repair a building. In complicated medical and surgical cases it is the universal custom to obtain second opinions. In prolonging the life of buildings such a course

is the exception amongst practitioners in architecture. In many of the important works of preservation in recent years great controversy has taken place in the methods employed, but I venture to think that the undesirable publicity given to the dissensions which arose would have been avoided if the architects engaged upon the work had consulted specialists. Here my analogy of the medical profession ends, for I feel confident that the repair specialists would not require such fantastic fees for their services as is customary in medical affairs, although great gain would result from their assistance.

It is well known that the Society for the Protection of Ancient Buildings has rendered great service in the cause which its title proclaims. Its committee holds a weekly meeting, at which questions of great diversity are debated. Advice, based upon continuous and unrivalled experience in the treatment of ancient buildings, is freely given and largely acted upon, to the historical gain of the structures and to the advantage of the promoters. The publication of the Society, entitled "Notes on the Repairs of Buildings," is now, after ten years' existence, undergoing revision and extension by a sub-committee, and it is hoped that when issued it will be a standard work upon this perpetual subject.

The Council of the Royal Institute of British Architects and the Art Committee especially have devoted many of their labours to the service of preservation. Other societies have been, and are, willing to lend their aid in these matters, so that it cannot be said that we architects are lacking in bodies or persons who are well fitted to give special advice in works of repair.

Our difficulties generally lie in prescribing the right methods and materials, but not infrequently the correct diagnosis is our trouble. Preliminary examination cannot be too thoroughly undertaken. A hasty and limited inspection but imperfectly tells of the causes at work, and it is for this reason that architects themselves should personally view all defects and not depend upon the testimony of clerks of works and others. Again, as has already been said, no two buildings are alike, and all old works must be considered according to their particular character and requirement.

It frequently happens that on seeing a crack in a wall the architect, with that promptness associated with men of action, orders the careful underpinning of that part of the structure, whereas a fuller investigation would prove that the trouble arose from a roof thrust, or some transmitted wind pressure. Then while the operatives are laboriously carrying out the instructions, and probably creating greater risks to the other parts of the fabric, the promoters are busy straining every effort to collect funds from an overtaxed community to pay the contractor.

I have seen recently a church where some twenty years ago some thousands of pounds were spent upon structural repairs, which were soundly executed at the time. The diagnosis, however, was then faulty, for the vicar and churchwardens are now faced with precisely the same problem as presented itself at the time of the previous repairs. A photograph of the settlements or cracks taken prior to the renovation in 1893 shows failures identical with those which have this year again been dealt with. This church was an interesting example of strains being transmitted to distant parts of the fabric—a matter always to be remembered in surveying an old building.

The steep roofs of the thirteenth century invariably left some sign of movement in the walls of that period; indeed, in the majority of cases the change in the later line of the upper or clerestory part of the wall has probably taken place during the time of the extension. Thrusts of roof timbers, which tend to move or crack a wall, can invariably be absorbed by tie-rods or by some correction in the framing of the roof.

Architects are frequently guilty of recommending the removal of old oak bell cages and substituting an iron-girder system of hanging bells. In the majority of cases it is possible to

maintain the oak cage which transmits weights and thrusts to parts of church towers expressly built to receive them.

The common practice of building buttresses against old walls to resist these movements is seldom attended with success. It is remarkable to observe the manner in which buttresses and other features added to a church have not succeeded in clinging to the old structure, and have failed in their functions of support; yet the ancient walls remain standing.

Too much repair is frequently worse than too little, in that additional evils are spread by an excess of new work. Failures in walls, piers, arches, vaults, and the like require to be watched, in order to determine if the causes are active. For this purpose "tell-tales" should be placed over the fissures or lines of movement, and should be dated as they are applied. They are usually made of cement in a rough way about four inches long by one inch wide. They should be kept wet to ensure a slow setting. Cement tell-tales, however, are apt to mislead, owing to the tendency of the material to expand and crack. Plaster-of-Paris is a better material for the purpose, as, although it is quick setting, expansion does not take place to the same extent. In any case the structure must be thoroughly cleaned of whitewash and saturated before the "tell-tales" are applied, and they must be carefully made—that is to say, quite true and flat—in order to stand accurate tests.

## BUSINESS ARRANGEMENTS.

With regard to the business arrangements applicable to works of repair, agreements are necessary, although contracts in the ordinary acceptation of the term based upon tenders are undesirable. It may be possible to estimate the value of a new building, but it is highly improbable that the full nature or extent of repairs or alterations of old buildings can reasonably be anticipated. In the latter types of work there is so much risk in venturing upon a contract sum that waste or hardship may fall upon one or other of the contracting parties.

It is essentially desirable that where possible all reparation works be not subject to limits in time or outlay. I know of no better system than that all labour, plant, and materials should be hired or purchased by a builder or by a representative of the employer. All statements of rates of pay and hours of work of the operatives, together with all invoices of materials bought or plant hired, should be rendered by the builder to the employer weekly or monthly, as the case may be. To these sums should be added the proportion or percentage rate due to the builder for his organisation.

The financial arrangements between the employer and his agent, the architect, are not herein involved.

In cases, however, where the architect, still acting as the agent of the employer, undertakes the general advice and superintendence, and, in addition, engages the workmen, buys plant and materials, and renders periodical accounts for payment, a special form of agreement defining the relative positions and responsibilities of all parties is of the utmost importance. Architects should, as far as possible, decline such duties, for not only are the financial risks to be avoided, but the comprehensive position of adviser, builder, and supervisor is untenable, and tends to eliminate that element of responsibility which is so necessary in these operations of building.

In effect, agreements should be clear, yet comprehensive, setting out in simple language that the builder agrees to build and the employer binds himself to pay, upon terms and conditions laid down by the architect.

## DURATION OF REPAIRS.

It cannot be urged too often that reasonable time is required for the efficient execution of repairs. It must be admitted that, apart from other influences, the survival of ancient works is

in a great measure due to the actual duration of building operations. Apart from records, this fact is seen in the development of the styles of churches and houses.

Repairs must be permanent in their intention. It should be remembered that no sound work should be disturbed, although repairs may be anticipated in a few years' time. Repairs to walls cannot be hurried, and must be executed in a wet state, and allowed to set before receiving weights, thrusts, or other forces inducing movement. Roof and floor timbers having been exposed to the rains must have reasonable time to return to their normal seasoned state when the roof coverings are finished.

Plastering should then be not unduly delayed, but a long setting period allowed. Strong draughts should be excluded, as well as heat and other elements inducing rapid setting.

The use of mortar in frosty weather is attended with risks. Cement is not affected to the same extent as limes.

## SHORING.

Shoring is required to support walls or roofs subject to movement or collapse, and cannot be too carefully or promptly undertaken; much damage is done by the careless handling of timbers. Arches and other openings will require centering, which should be designed to counteract the thrusts causing failures in the structure.

A raking or flying shore employed to buttress a building where repairs will occupy a long period of time should have solid concrete sills, so that the timbering be not affected by soil movement and that greater and more permanent abutment be secured.

Needling must be carefully undertaken, and where the old displaced bricks or stones cannot be replaced the repair should be carried out with different materials, in order to record the disturbance and the extent of the work. Shoring should be allowed to stand for a long period before being eased or struck.

When effectually shored it is frequently desirable that the walls of a building be grouted before underpinning or other works are attempted.

All shoring which will probably be left in position for a considerable period should be limewashed, in order that it be more easily seen and that the timber be preserved.

## GROUTING.

No greater advance has been made in the repairing processes in recent years than in that of grouting. Many a condemned building has been saved and many a weak structure made sound by this means, and more particularly when used under pressure.

The injurious effects of vibrations upon ancient buildings, especially those having rubble-built walls, due to fast and heavy modern traffic is a matter of grave importance. The Science Standing Committee is investigating this question with special regard to belfries.

It is to that eminent engineer Sir Francis Fox that we owe so much in the recent development of grouting by mechanical pressure. For a detailed account of the history of the grouting machine reference should be made to the Paper which he read before the Institute in February 1908.*

It frequently happens that a fractured rubble wall, a weak footing, an insecure bridge has failed, and can only be repaired by first consolidating the masonry before foundations or other repairs are dealt with. Briefly stated, the method of applying cement grout is as follows:—The operation, like underpinning, must be performed in small sections. All loose dry mortar and dust is first removed; that which escapes being raked from the open joints is blown out. Great care must be taken not to dislodge the aggregate of the wall—that is to say, the rubble, the bricks or stones, as the case may be. Large stones should be wedged up.

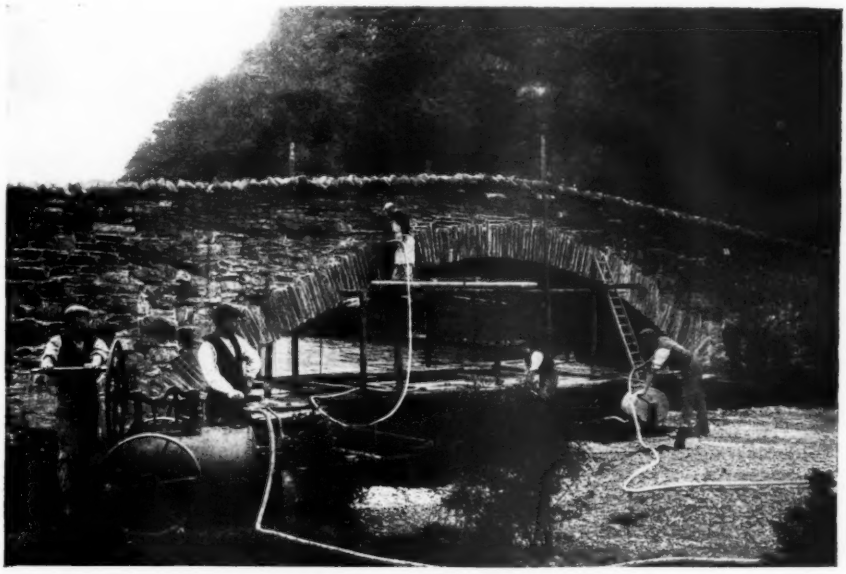
The parts of the wall thus cleared are then well saturated, also under pressure, after the

* Journal R.I.B.A., 22nd February 1908.

face joints are blocked up, usually by wet clay. This moistening will slake the inert properties of ancient lime, and assist the process of solidification. The grout, mixed according to requirements, is then forced by the machine into the wall through a small aperture left for the purpose. The clay joints should be watched, in case the grout escapes prematurely: experience will determine when the particular section is fully grouted.

It is usual to use a slurry composed of one part of cement to one part of sharp, but not too coarse, sand. Frequently neat cement is injected into the fissures. The effect of this injection is to solidify the wall, leaving it in a state reasonably safe for the underpinning, the cutting out of cracks and bonding in strong material, or other operation.

The clay sealing of the joints is removed after ordinary setting has begun to take place, when it will usually be found that the grout has penetrated the wall or structure under treat-



GRANGE BRIDGE, CUMBERLAND: GROUTING MACHINE AT WORK.
Sir Francis Fox, M.Inst.C.E., Engineer.

ment. It is then desirable to point the more open of the joints of the external face to exclude weather. It is not necessary, however, to point internal joints, but to leave them open in order to show that the old materials have been grouted.

Grouting by hand has its limitations, and is dependent upon gravitation. Under mechanical pressure the liquid rises to considerable heights and travels surprising distances.

There are occasions—usually in thick walls—when, I am of opinion, hydraulic blue lias lime-mortar would be adequate as a grouting medium. Expansions and, in many stones, an unpleasant discoloration are then avoided.

Lime grout is very desirable where walls have not fractured but have hollow places. Lime-mortar built walls have endured a sufficient time for all ordinary purposes. There are many limes which harden to a very great degree sufficient for most ordinary purposes. Smeaton used Leicestershire limes in the erection of lighthouses. One of the Derbyshire limeworks has been working continuously for seven hundred years.

Grouting adds materially to the weight of a structure. A ton of cement and sand is soon lost in a mediæval wall, but its results are wonderful.

Winchester Cathedral has been saved by this method. In a recent conversation with the Dean, he informed me that "it is the safest building in England: it is monolithic." It is hoped that this will be found to be a sound judgment.

Sir Francis Fox has grouted and saved historic bridges condemned by county authorities; he has grouted the walls of a large institution when entire rebuilding threatened the proprietors, whose funds were unable to bear so great a strain; he has grouted the eighteenth-century walls of a London building upon which a dangerous structure notice had been served by a watchful district surveyor, who, after testing the repaired house, accepted the process for the more customary one of demolition and rebuilding.

HOUSES IN GREAT ORMOND STREET, BLOOMSBURY, REPAIRED BY GROUTING. Sir Francis Fox, M.Inst.C.E., Engineer.

Members of the Institute Council have been privileged to inspect the works in hand at St. Paul's Cathedral, where grouting is being employed to the utmost advantage. Here the main piers and buttresses of the dome are faced in ashlar, but have a core of rubble, sometimes of chalk, but principally of small stones. The solidifying of these features will prepare the way for any further structural operations which become necessary; but it is to be hoped that these works will be pressed forward, and that risks from delay or insufficient staff will be avoided.

## REPAIR OF RUINS.

In many respects ruins require special treatment in their repair. Much loss of interest is occasioned by a general scheme of reparation being undertaken at any one time. It is, therefore, essential that only such parts as are in a state of collapse or are causing injury to other parts should be touched. In effect the repairs usually necessary for a building in use should have a modified application to those in a ruined state. But there is no wholesale department in the business of either.

Generally speaking, the tops of walls, arches, or other features require most attention, in order to arrest the penetration of moistures and the consequent disintegration of masonry. Asphalte, tar-paving, cement-concrete, or tile-paving are good media; in each case the method of laying should be governed by the necessity for throwing off water. In many cases soil and turf may be relaid upon the paving or covering in order to retain the hand of Nature, which provides that pleasing compensation for the sense of loss sustained by the ruined state of the building. Foundations marking the site of departed works should be specially preserved. Ivy and other large growths should be constantly cut back. Ivy will grow completely through

a 3-foot stone wall, and appears to receive nourishment from mediæval lime-mortar. The chances of the retention of moisture thus afforded renders the removal of these creeping things an essential step.

Similarly attention should be directed to the lower parts of ruins, so that grass or soil shall not accumulate to the detriment of walls, piers, floors, and other parts.

Roof protection should be provided to any features such as sculpture, carvings, woodwork, metalwork, and the like, subject to injury or decay by reason of exposure to weather.

All loose features should be firmly built in and wedged up in good mortar, whilst all fallen stones, moulded or otherwise, should be collected and preserved from risk of theft or damage by traffic.

## SCAFFOLDING.

It is most important that scaffolding and plant generally be utilised in such a way as to cause no injury to buildings by its erection and removal. For this purpose an independent scaffold is generally found preferable. This type may be thought to be more expensive than the attached kind; but inasmuch as cutting away and reinstating are avoided the relative costs cannot be said to vary appreciably.

It is sometimes found that putlog holes remain in ancient walls, in which case an ordinary single scaffold may be used. No new holes should be permitted to be cut. Thirteenth-century flint rubble walls sometimes retain putlog holes, and they are formed in stone- or chalk-dressed openings. These are found in stages at intervals similar to those used at the present day. In most cases the intervals of the stages should be adapted to the requirements of the actual work. Old putlog holes or resting places or ledges should have suitable protection by straw or sack packings.

Various types of modern wood and iron scaffolding are serviceable in the repair of old buildings, but the common is to be preferred to the patent variety. Cradles suspended from high positions are useful and economical in particular cases; but where the repairs involve repeated hoisting and lowering of the plant the cost becomes heavier than ordinary scaffolding. All scaffolds, however, should have means by which architects of all ages and dimensions can easily ascend to and descend from the works in progress.

## PULLING DOWN.

Although the subject before us is preservation, there are occasions when demolition is to be faced. No effort should be spared in the careful handling and protection of material intended either for re-use or removal. Although the occasion is rare when a rebuilding with old materials is entirely satisfactory, it is essential to mark or number the stones, timbers, and other parts, and to provide due protection.

When the Tattershall Castle fireplaces were taken out an insufficient scaffold was erected, and these priceless carved stones were dropped upon the ground below, causing several of them to be fractured. Some of the long stones bonding into the walls were cut off, and other mutilations were perpetrated. It is a matter of national congratulation that these mantelpieces have been carefully replaced by Lord Curzon in their original position, and, thanks to the personal supervision given by Mr. Weir, they look little the worse for their adventures.

Pulling down should be deferred until the last available moment in cases of necessary alteration or enlargement, in order that hope of retaining the old work be not abandoned until all alternatives have failed.

To illustrate this point I would refer to a Norfolk example [see illustration page 109]. The controversy at Overstrand will be fresh in the minds of many. Here a ruined and roofless mediæval church occupied a spacious churchyard containing also a Victorian structure in regular

use for worship. The latter, appearing to become inadequate to the needs of the parish, required enlargement; but, after an acute public discussion, was abandoned in favour of an extensive enlargement and reinstatement of the ancient ruined fabric. A new north aisle was to form part of the ultimate extended church, but was to be deferred until funds were forthcoming for its erection. Vestries, however, and a heating chamber are now built, whilst the reinstatement of the ruin is proceeding. But the sound north wall, containing the stonework of two windows, has been pulled down to make room for a new arcade, which is to be filled in, pending the influx of money to pay for a north aisle to be built hereafter.

There are two serious comments to be made. First, the initial extent of the renovated church has substantially the same seating capacity as the existing modern building; so that no immediate cause existed for such a restoration; secondly, it was an outrageous proceeding to demolish an old building in preparation for work for which the necessary funds may never accrue and which the general conduct of this matter may have caused to be delayed indefinitely.

At the completion of all repairing works there is an accumulation of minor objects of interest, such as tiles, carvings, pottery, glass, implements, &c. These should be labelled and stored in the building for inspection. On no account should such things be removed. For several recent months in the *Architectural Association Journal* a paragraph or advertisement appeared inquiring for old encaustic tiles. Nothing could be more deplorable than the sale or traffic in these materials, which have great value upon their original site, and nothing is more disheartening than to find inadvertent encouragement being given to this practice.

## UNDERPINNING.

There is, I think, too great an inclination amongst architects and constructors generally to underpin old buildings, especially those of mediæval date. Rubble walls indicate the action of roof thrusts or undue movements very readily upon the inner and outer surfaces. It is then that underpinning is hastily resorted to, and it frequently happens that the operation is proved to be unnecessary. It involves, moreover, risk of disturbance to other parts which are sound. Underpinning is more effectual when undertaken generally rather than partially.

It is remarkable how little apparent consideration was given to foundations of old churches and houses. There is no order or practice in the ancient method of transmitting building weights to the soil. Generally speaking, the footings are quite shallow, and beyond containing large material are usually without definition in the spreadings when such exist. Yet it must be admitted by their simplicity that foundations were well understood by the early builders.

Foundation failures are invariably due to such causes as the digging of graves, heating-chambers, cellars, to defective drains, and to alterations and other subsequent disturbances.

As an example of the knowledge of mediæval builders in the matter of clay soils the following is of interest. At Chattisham, near Ipswich, the land is entirely a stiff clay. As frequently happens in church towers, the weakest angle is that containing the turret staircase, and in this instance it had, together with a rubble and stone buttress, settled considerably, from causes traceable to a defective drain. The remainder of the tower walls was in fair condition. On examination, it was seen that in building the tower a large pit had been dug 1 foot 6 inches beyond the area of the structure. Into this hole, the clay sides of which were clearly disclosed, had been thrown coarse river gravel, and directly upon this the rubble walls of the tower were built. There is an almost entire absence of footings, and the bases of the walls are unduly near the surface of the ground; yet the tower generally has stood its 600 years remarkably well. Underpinning was not required, but a consolidation of the gravel bed became necessary before rebuilding the disintegrated staircase turret and buttress.

All underpinning must be carried out in short lengths, and the new material be wedged

or pinned up to the old. A damp-course should be inserted when possible. Horizontal damp-courses should project beyond both faces of a wall. No underpinning should be begun until the soil is free from possible influence by drainage. Cement is the best matrix for mortar used under these conditions; it should be of a quality capable of passing a standard test.

## DRAINAGE.

Defective drains are a perpetual source of danger to buildings. These faults are not detected until dampness or some failure in walls is observed. Similar injury is occasioned by faulty eaves gutters and downpipes.

Concentrated water soaks into and loosens foundations or penetrates walls, to the destruction of woodwork and decoration; the soaking-in is intermittent rather than persistent, and therein lies much of the trouble.

In the matter of churches surface channels are in all cases to be preferred to hidden drains, and should at all times be kept clear. In cases where eaves exist it is often desirable that no gutters or downpipes be provided, for the water can then fall upon a paved walk provided with a suitable channel, and the whole laid to proper falls. Water coming off a valley or a tower may have a shoot to throw it clear of the structure on to a wider paving at the foot of the walls. Provision should be made for receiving the splash by the erection of a stone or tiled plinth, or by pointing the lower courses of the wall in cement. This plinth is useful in covering the joint between the pavings and the walls; it is often found that the former moves away from the fabric. The omission of eaves gutters greatly enhances the interest of a building.

Surface channels should be laid below the level of the adjoining floor-line. Retaining walls may be found necessary when the ground-level is above floor-line. When underground drains become necessary it is imperative that they be laid some distance from the walls, and in churchyards should follow the lines of paths in order to avoid disturbance from burials.

Drains of churches usually take care of themselves; those of dwellings have statutory supervision, and are too well understood to require reference on this occasion.

When eaves gutters and downpipes are indispensable in important buildings they are best made in cast lead, and although the initial cost is very much greater the constant painting of the cast-iron varieties lessens the apparent gulf between the cost of the two materials.

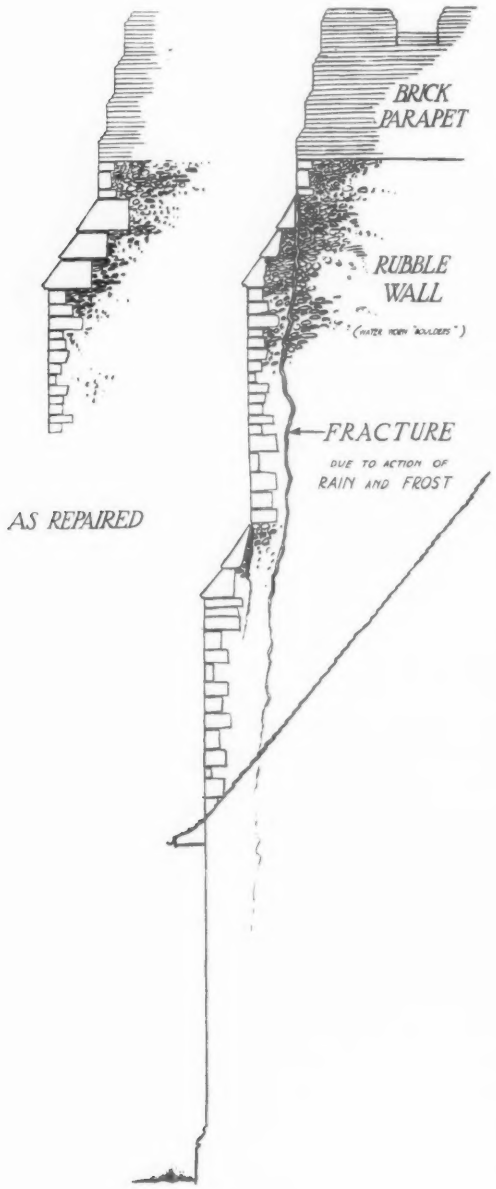
Iron pipes should always be of circular section; square pipes should only be used when fixed well clear of the walls to enable the periodical paintings to take place. Expansions due to temperature cause less havoc under these conditions.

## RUBBLE WALLS.

It may be said that more than half the ancient buildings in this country possess what may be termed rubble walls, and are therefore the most general of the repairs with which an architect has to deal. Stone and brick in certain districts were not procurable in sufficient quantities to produce the desired masses. Rubble was invariably employed to supply the deficiency. A rigid discipline in the use of materials in mediæval times is evident from the variety in size and description of materials seen in every work, and this has added much to the charm of early building. There was no wastage. All sound stuff, however small, was used, and it was not only good but efficiently built. That is a lesson we very much require to apply to our own work. We are too apt to discard small available material.

In rubble-faced walls all small materials, such as flints, pebbles, fragments of stone, bricks, and tiles, were mixed with lime-mortar. The whole was worked up and laid in a concrete manner in conjunction with stone or brick quoins set in the internal and external angles. The rubble

could only have been laid against boards or other centering in the same way as we build concrete. Instances are met with where the marks of the joints in the boarding show upon the mortar faces.




RUBBLE REPAIRS.

It will readily be understood that the use of angle stones was twofold; first, to facilitate the accurate building of the rubble, and then to afford greater permanence to the exposed angles from the effects of wind, rain, and frost.

The excellent condition of the rubble walls of the Romans is a remarkable testimony to their constructive knowledge. Local materials were always used and understood by them. The tile bands which are sometimes bonded through the full thickness, and often built to a partial extent into rubble walls, are not only pleasing in effect, but became, in my opinion, absolute necessities in good concrete building. London Wall was so built. Early mediæval workers in the Eastern Counties made use of these tile bonding courses; but, generally speaking, rubble walls are devoid of ties of any kind. No rubble walls have survived so well as those with the tile bands.

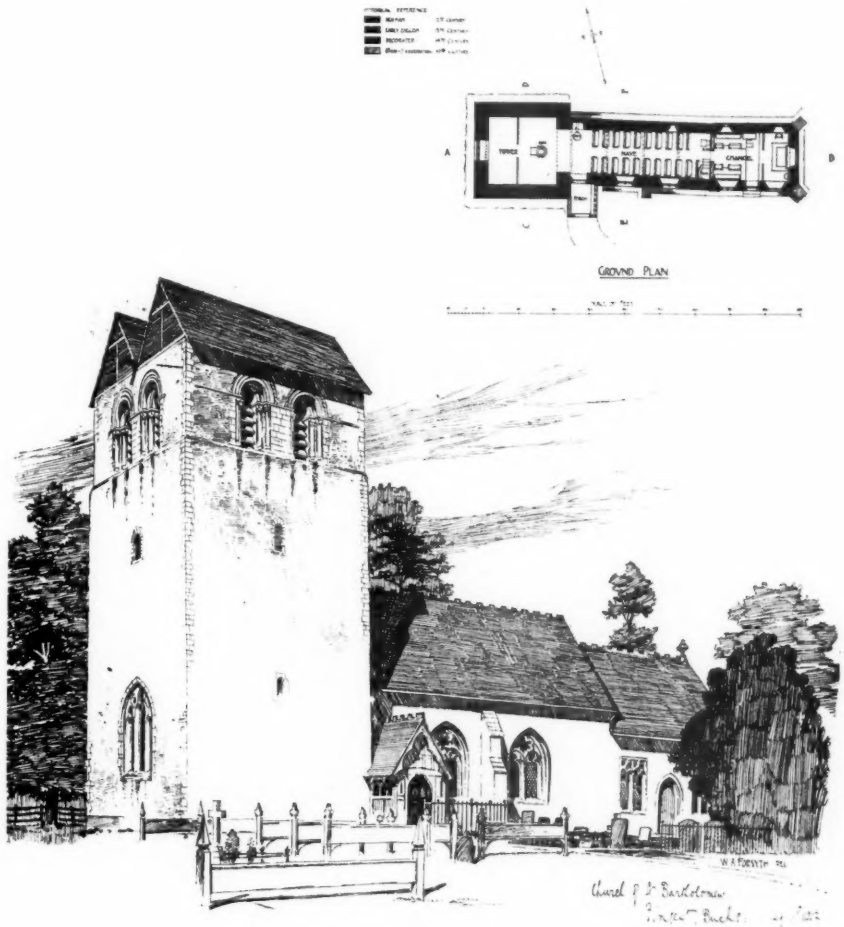
Rubble walls are sometimes misunderstood by those who repair them. It is the invariable custom to point the spaces between the aggregate materials after the matrix mortar has to an extent been removed by weather. The pointing is, moreover, usually performed by the aid of a metal trowel.

In almost all cases no pointing is required. The faces exposed to the rainy quarters are those mostly found to have these mortar interstices washed out; but it is only in the dire extremity of the solid materials having become loose that any repair is necessary, and, indeed, can be efficiently performed. Then it will be necessary to cut out convenient patches, prepare the wall, and build in the old material in a concrete manner with centering. Bonders should at the same time be inserted. In all cases flints used in repairs to facings should be "dug" and not used from surface collections.

## MASONRY.

The decay of masonry presents many difficulties in preserving or protecting ancient buildings. Stonework can be patched either with new stone or other materials; it can be entirely rebuilt, and it may be coated with preservative solutions.

The failure of the ashlar or other facing, moulded and carved work is due to atmospheric causes, and the action of the destructive agent will always vary according to locality or season.




FINGEST CHURCH, BUCKS. EXAMPLE OF RUBBLE-FACED WALLING.

In this matter, therefore, no general rule can be applied to the treatment of stone buildings. There is to be observed, however, the governing principle of clearly expressing the repairs or replacements in all works of preservation.

No more instructive instance can be quoted than the sad decay of the stonework of the city of Oxford. Here the failure of the local material is a matter of deep regret and a subject for serious consideration. I think it is generally admitted that the mediæval builders used sound

material obtained from the neighbouring quarries, but the architects of the sixteenth, seventeenth, and eighteenth centuries employed inferior Headington stone, the facing of which fared so disastrously in the last century. The flaking and crumbling of this ashlar work is familiar to most of us, and my purpose is to draw attention to some of the methods employed in dealing with the defective work.

The facing of the St. Auld's front of Christ Church has perished considerably, and generally throughout the façade. An entire refacing has been carried out by Mr. Caröe, giving to the buildings a newness which, although a drastic expediency, was perhaps unavoidable in the circumstances.

Astonbury, Herts. Repaired by Messrs. Forsyth and Maule.

At Magdalen College Tower Mr. Warren had a more structural problem to face. In many respects the work of repair was attended with some anxiety, and great care was taken to effectually arrest further decay.

This work, in effect, consisted of piecing or patching the old structure with new stones, and in many respects the method was easy of adoption.

At St. John's College, however, an entirely distinct process has been applied by Mr. Harry Redfern. Again the Headington stone had seriously failed on the garden front, not alone confined to ashlar, but to mouldings, mullions, and other important parts. No new stone has been inserted to replace old material. All loose and badly decayed work was removed to receive roofing tiles and hydraulic lime-mortar built to the approximate form of the mouldings or features repaired. Ashlaring and copings were similarly treated, and when the work proceeded the new materials were rendered with the lime-mortar. This method has many advantages, in that it ensures a sound structural combination between new and old work by the facilities for pinning up. The repair, moreover, although sympathetic in tone, is readily expressed so that in generations to come he who runs may read which is the work of Inigo Jones and which the work of a Fellow of this Institute in the twentieth century.

The preservation of stone by the application of solutions has much to recommend it, except the quality of durability. Many media are commercialised to such an extent as to

arouse our caution, but no test other than that of time upon a building should receive our consideration.

It is known that those liquid remedies claiming silica as their basis are liable to set up worse diseases. The first application penetrates to a certain depth and hardens; the subsequent applications are expected to, but probably do not, increase in penetration, but rather seal up whatever pores were left by the first coat. The mortar joints are also treated in order that moisture shall not enter the wall and get behind the sealed face of the stonework. The aërating properties of the wall are arrested. Any dampness, therefore, lying in the wall or entering from other sources is liable to be the cause of expansion in cases of frost, and either the inner or outer faces are injured thereby.

The process of limewashing appears to avoid such risks. At Westminster Abbey a great work in limewashing is being carried out by Professor Lethaby. The principal original material is Reigate firestone. Upon most of the exterior this has been in former times largely replaced

West Stow Hall, Suffolk. Repaired by Mr. W. Weir.

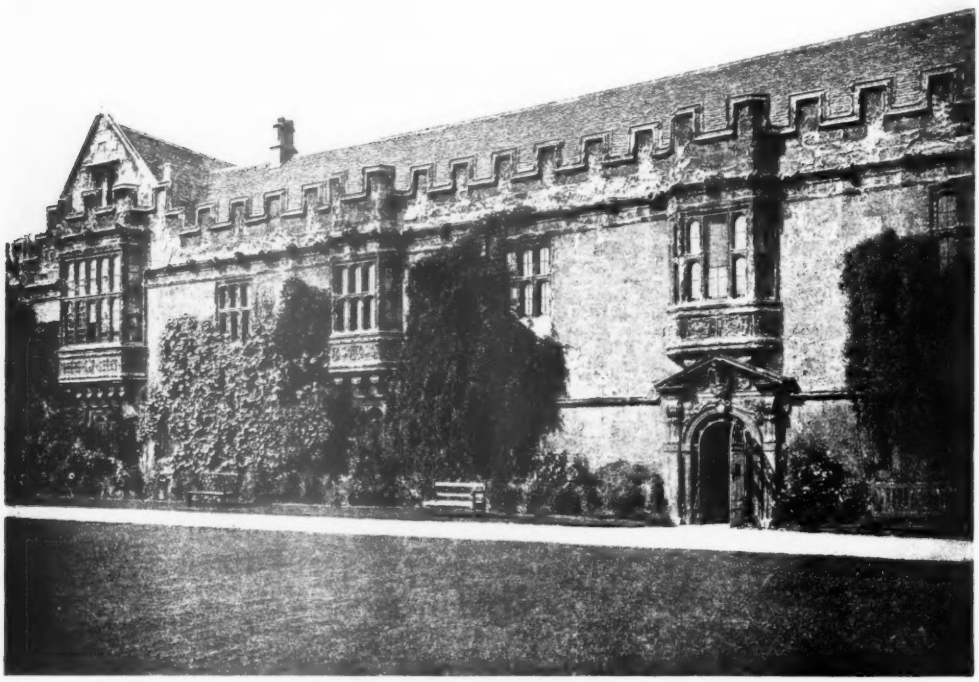
by other varieties of stone by the "replacing" school of architects. The only remaining original material having external exposure is fast decaying in the atmosphere of London, but the destruction is being arrested by the application of limewash. The operation consists of the slaking with boiling water of Barrow hydraulic lime to produce a comparatively fine solution or paste, and of the application, by means of a brush, of two or more coats, according to the state of decay. To avoid glaring results, some colour is utilised to assimilate the tone of the applied material to its environment.

The process has been going on in the vaulting of the cloisters for some years, and is found to be a successful "healer" of the diseased stone where applications of other reputed preservatives have failed. In appearance, too, the effect is good, as after the lapse of time the lime appears to have entered into structural combination with the stone, and mouldings, joints, and other details become sharper and well defined. It is satisfactory to think that the spirit of the beautiful early work in these cloisters is retained by so simple a process. The idea is

not new, for it will have come within everyone's observation that a whitewashed stone wall is often preserved when the untreated surfaces of the same wall have perished. It is in the nature of a revival. This limewash is gentle in its action.

The application of baryta water has been extensively and successfully attempted. A grey tone is produced upon decayed stonework after it is prepared for treatment. The process is laborious. In making use of the foregoing means of repair a few practical observations may not be out of place.

It is claimed by many that stone should be quarried and used fresh, so that the "sap" is allowed to evaporate when the material is set. A harder external face is thus formed than if the



St. John's College, Oxford: Garden Front from the East.
From Mr. Aymer Vallance's *Old Colleges of Oxford* (Batsford).

stone is free from sap when dressed. Mortar will be enabled to set less rapidly, while the body of the wall will have less tendency to set independently or separate itself from the facing. Others attribute decay in stone to quarry sap. This is a subject for investigation.

All inserted stones should be pinned up in tile or slate, and care taken that the surrounding wall, as well as the new material, be well saturated. Mediæval builders were great users of tiles for this purpose. Tiles should, of course, be hand-made and of a roofing variety as a rule. The pointing of mortar joints should differ from the original work. Materials must be carefully selected, in order that the repairs be permanent. Stone is especially important. The recent

repair of a Victorian stone restoration to one of the few mediæval buildings in London emphasises this matter.

Lias lime-mortar is preferable as a general rule to cement-mortar, by reason of its slow-setting nature, and its avoidance of discolorations, expansions, and other causes of injury.

Brick walls, in the structural sense, do not call for any great difference in treatment; the bonding in of sound materials, the insertion of footings and damp-courses and kindred requirements are similar in process to rubble or stone walls.

New facing bricks of sympathetic yet of ascertained durability are necessary for the replacement of missing old materials where such renewal is essential to the protection of the building. Old weathered materials falsely record the story of the workmanship, which is the actual story we wish to preserve.

Roofing tiles are of great use in the piecing and repair of brick walls, and cannot be too frequently used. Slates are legitimate substitutes where hand-made tiles are difficult to obtain in pinning up or wedging new work to old. Firebrick should with rare exceptions be used in old buildings.

Reinforced concrete is best for lintels built into old walls; these may be inserted or cast in position, according to circumstances. It is a material, however, which requires careful application. The large proportion of steel used in reinforced concrete buildings to-day leads one to believe that trouble will arise in time from the action of the steel, due to climatic changes, and that the unequal expansions and contractions due to heat and moisture will induce failures in years to come. Old buildings in use have structural histories of 800 years; ferro-concrete is in its infancy.

Steam and other mechanical cleaning processes of external brick and stonework are to be undertaken with caution: there is a risk of opening the pores of the material to admit fresh causes of trouble.

## POINTING.

Pointing is the only repair which is common to all buildings, and will vary in its materials and manner according to circumstances. When applied to historic buildings care should be taken that some distinction, however slight, should be made between the finish of new and old joints. What is of greatest importance is the determining of what shall be pointed and what left untouched; but I think as a general rule this question should be governed by the extent to which open joints are liable to cause injury to walls by the admission of weather. A slightly recessed joint should never be touched; a deeply sunk joint must be pointed.

Great care is required in preparing open joints for the new mortar. As a rule a joint which cannot be prepared by raking should never be pointed. No joint should ever be cut out or hacked out unless for some special purpose, such as grouting. After removal of loose particles the old work must be saturated in order that the moisture of the new mortar be not absorbed by the dry wall, thereby reducing the setting of the new mortar. This wetting will also energise the inert qualities of old lime-mortar and assist to a moderate extent a structural combination in the two mortars.

In the majority of buildings with which we in this country are concerned cement pointing is detrimental both to their preservation and to their appearance. Cement is a powerful ingredient, and is liable on setting to expand and loosen wall facing. Frequently it is seen that cement pointing has remained intact when the brick or stone facing has perished; the ledges thus formed retain the moisture in the wall and prevent rain running off as in the case of an evenly-worn wall, such as a lime-mortar permits, and decay is accelerated. With the many limes in use a good selection can be made for the mixing of sound mortar. Blue lias

limes are, perhaps, the most durable in vertical work. The same material, stiffened by a limited admixture of Portland cement, should also be used for horizontal work, such as the tops of walls. Sand cannot be too sharp and coarse. When fully laid in a prepared joint the mortar should be pressed in by a wood tool, or by the thumb or fingers. The joint should never be finished with a trowel unless it be cut off flush with the facing; generally speaking, however, a slightly depressed joint is preferable for weathering reasons and for expressing the interest of the walling materials.

## ROOF COVERINGS.

*Tiles.*—The repair of old tile roofs is a matter deserving our caution. Into the numerous methods of laying tiles throughout the country it is not within the intention of these notes to inquire. What is of paramount importance, however, is the quality, and in this respect I would urge the sole use of hand-made sand-faced tiles, to the exclusion of machine-made or pressed materials. This is necessary for durability, apart from the mean thickness and hard lines of the mechanically produced materials. Reference to this subject is, I feel, desirable in the interests of clients and architects, judging by the many recent failures brought to my notice. A sub-committee of the Science Standing Committee is engaged in investigating failures in roofing tiles, and it is to be hoped that an early publication of its findings will be made.

Old roofs appear to gain in scale and interest when the repairs are visible. It is not always possible to secure old, weathered tiles for repairing ancient roofs. Rough, well-burnt materials should, however, be used, and the tiles should possess considerable "camber," not only in their length, but in the width. They should also have generous substance.

The cambering of tiles is, perhaps, the most important quality in their manufacture. Capillary attraction is thereby reduced, and the air spaces thus formed are valuable for assisting evaporation of moisture and in preserving the tiles. This is important, for in my observations of the many failures of machine-made tiles it is invariably the roofs nearest the ground or in damp places which fail most. To exclude draught and driving snow from tiled roofs it was the ancient custom to lay the tiles in hay or straw. In Norfolk the spaces between the laths were filled with reeds. In each case, however, the packing material was kept away from contact with the ordinary rains, and was confined to the heads of the tiles. Evaporation was but slightly arrested. In all cases counter-battening is essential to the successful use of tiles. These under-battens, if laid diagonally, will brace the roofs against wind-pressure in a wonderful way and provide a convenient means for fixing laths when plastering between the rafters is desired. The bedding of tiles is to be avoided, as, amongst other risks, the tails are liable to be broken in frosts. Torching is good when used to a limited extent.

The rounded valleys of old roofs are delightful features to the eye. But it is remarkable to what extent they have been, and indeed are always being, repaired. Bedding was the principal method of fixing. I venture to think that most of these old examples were unworkmanlike, for the simple reason that in endeavouring to maintain the uniformity of the horizontal courses the tiles in the centre of the valley lost their "lap"—that is to say, these particular tiles were not made long enough in order to provide adequate lap to meet the flatter slope which the valley naturally assumes.

A very good way of producing rounded valleys, although at the expense of maintaining the horizontal courses, is to fir out to a width of 15 inches and to hang "tile-and-a-halfs" up the centre of the valley. The ordinary courses follow from these middle tiles, and the extra lap in the valley is thus provided for.

The repair of houses sometimes extends to tile-hanging or weather tiling. One small point is worthy of notice. Cutting is unavoidable at the intersection of the vertical tiling with

the roof line, yet if the horizontal line be maintained it happens that a few end tiles will lose their nail holes in the process of cutting. This may be avoided by turning up the lines of the last tiles at the end of each course; extra cutting is involved, but provision for adequate fixing is made.

*Lead Roofs.*—It is perhaps unnecessary to remind architects that cast lead sheets are preferable to the milled quality. Re-casting old lead should be done on the site of the building under repair. Flats should receive a fair slope of at least 1 inch in 25 or 20. Boarding must be run parallel with the fall. Welts should, if possible, be used on church roofs. Wood rolls when used should have grooves or throats to arrest capillary attraction. Drips should have similar provision.

*Asphalte.*—Few materials require more careful selection than asphalte. It is extremely difficult for architects to tell good from bad. It is, however, essential that the bitumen should be thoroughly distilled before mixing with mastic asphalte, and be devoid of fibre. This material, never found in ancient works in this country, is of great use when other materials cannot so readily be used to effect structural repairs. It has many qualities which render it attractive in exposures to moisture, heat, and cold. It is especially valuable in covering old copings and cornices, rendering their preservation comparatively easy, without disturbing the old work. In all cases it should, however, be kept from view, as its uniform character does not please the eye in any sense.

Limestone- and tar-paving is another useful and efficient means of protecting the tops of walls, vaulting, or foundations of ruins. Turf and other growths should, however, be relaid upon it.

## PLASTERING.

In no department of our work is greater care required than in the manipulation and application of plaster. In old buildings greater caution still is necessary in order to secure adhesion of new material to old surfaces. Material is all important.

It is not necessary to remind those concerned with old places of the presence of paintings and other decorative works below old whitewashed faces; the preservation of these colourings is a matter apart from ordinary structural repair, and should only be undertaken by those much accustomed to the work.

Repairs to plain plastered surfaces should extend to the actual defective area; the temptation to replaster a whole wall for smartness and uniformity should be avoided as far as possible.

Limes must be reliable and of known condition. Sand cannot be too coarse or clean. Hair should be obtained from tanneries where the old-fashioned process of detaching by the immersion in lime is still in force. Most hair now in use is removed from hides by means of chemicals, and is, in consequence, brittle. Leather suffers by the same process.

Plastering can be applied in one coat. No more than two, however, are necessary, and it should always be spread and worked up with wood floats. Smoothness of finish, which is always out of scale as well as sympathy, is thus avoided in wall treatments. It is useless in external work. The ornamental and geometrical patterns seen in the Eastern Counties domestic work were necessary to the weathering properties of the plaster.

Rough plaster will dry out better than smooth; it also causes condensation to a much less degree than fine finishes, and distemper will bite at once and not scale off. Slow setting, however, is always necessary, and involves much preliminary and subsequent moistening of old and new work.

Metal lathing should not be used. Decorative plasterwork requires very skilful handling for its protection.

## FLOORS.

The greatest wear and tear upon a building is perhaps to be found in the floors. Renewals should, as far as possible, be made with materials kindred to the old. Where modern flooring is indispensable it should take the form most harmonious to the position in which it is laid. Uneven floors or pavements should not quickly be condemned; they can be made fit for use by ordinary repairs.

All paving laid upon concrete should have a heavy layer of dry rubbish or hard core immediately upon the soil; this bed should be rammed and of an absorbent nature. For this purpose broken brick is best, and condensation is greatly reduced. A layer of agricultural drain-pipes is an efficient, though costly, process. All new pavings, whether tile or stone, should, for appearance, have large joints.

It is not necessary again to mention that mediæval encaustic tiles should be jealously guarded and retained in their original position. Any dampness showing in the floors may involve the relaying of the tiles upon concrete; in this case the old materials should be bedded in lime-concrete.

In thanking you for your patient listening, I would summarise my remarks by stating that I have endeavoured to draw attention to matters of urgency concerning our ancient buildings involving the loss of interest which may arise from wholesale departmental repair, from insufficient and inexperienced supervision, from neglect to consider each work apart from all others, and from that lack of importance which we ourselves are sometimes inclined to attribute to this branch of our studies.

## DISCUSSION.

Mr. George Hubbard, F.S.A., *Vice-President*, in the Chair.

Mr. LIONEL EARLE, C.B., C.M.G., Secretary of H.M. Office of Works: I have been asked to propose a vote of thanks to Mr. Forsyth for his interesting and able Paper. I only wish that somebody more competent had been invited to perform this pleasant task, as, being but a layman in all matters appertaining to building and architecture, I feel rather in the position of a non-scientific man being called upon to discuss the latest phases of cancer research with an assembly of eminent doctors. But I know you will be lenient with my shortcomings and excuse my presumption on the grounds of the deep-seated interest that I take in all questions affecting ancient monuments. The only claim that I can make to take any part in to-day's proceedings is due to the fact of my being the permanent Head of a Government Department dealing with large and varied questions of architecture and building, and more particularly of that very important branch which deals with our national ancient monuments. On this point I may perhaps be allowed to say a few words arising out of Mr. Forsyth's Paper. He has referred in terms of generous praise to the good work done by this particular branch, praise which, in my opinion—and I speak with a fresh and unbiassed mind, as I have only been a little over a year in my present Department—is fully deserved. I have no hesitation in saying that, thanks to the knowledge, training, and taste of our Chief Inspector, Mr. Peers, and to the remarkable skill, amounting, in my opinion, almost to genius, of Mr. Frank Baines, the architect in charge of this branch, it is, in its own lines, one of the best administered that I have ever come across in a somewhat varied career in the public service. In proof of this I may mention with pride, but in confidence, that I have not received one single protest against the way our Ancient Monuments Branch has carried out any of its repair work during the whole time I have been at the Office of Works. This is the more remarkable, I think, because, firstly, as we all know, a Government is always fair game to attack; and, secondly, because the critics often hold very strong, but somewhat divergent, views on all questions involving taste as well as construction. Mr. Forsyth has hinted that some of the buildings, owing to certain defects in the Government system, have been repaired too much. I should like to tell you that, although his criticisms may be just, they are not just either as regards the cause, or in putting the blame on deficiencies in the Ancient Monuments Branch. Certain buildings like Holyrood, Glasgow Cathedral, Chelsea Hospital, Somerset House, Edinburgh Castle, have not been under their care. I have already transferred some of these buildings to Mr.

Peers' watchful eye, and I am taking steps to transfer all such buildings which can be properly classed as ancient monuments, whether in occupation by the military or Government officials, to Mr. Peers' and Mr. Baines' fostering care. It is not the system which is at fault, but the methods of dealing with these buildings. What I mean is, that naturally among a large number of architects there are many who have not had the opportunity of an actual technical expert training, such as Mr. Peers has had. But now, as I say, these buildings which can in any way be classed as ancient monuments are going to be transferred to the Ancient Monuments Branch. Although in daily use as a Government Department, as Somerset House, work will not be done upon them without having the hall mark of the Ancient Monuments Branch placed upon them. In this way we shall obviate the criticism which, though perfectly just, Mr. Forsyth has called attention to in his remarks. I am bound to say that Mr. Peers has, on several occasions, brought to the notice of the Board restoration which in his opinion is in excess of what should be done, and this, in every instance, has been immediately rectified as far as possible. I may mention that at the present moment in France I am informed there is a considerable movement among archæological experts to protest against the over-restoration which has been carried out by the Ministry of Fine Arts ; and I am bound to say, having travelled largely in France, that I think their great fault in the past has been over-restoration. All our efforts are in the contrary direction over here. At this stage I would also like to say that if there are any members of this Institute—which has so often tendered its hospitality to myself—who would like to inspect, or learn, or make inquiry at any stage of work as to what is being done to ancient monuments under our charge, I shall be only too happy to give them permission to visit and inspect them at any stage before or during repair work if they make application through your Council. All we wish to do is to have our efforts as much before the public eye as possible, so that we may get genuine criticism if we sometimes go astray. A great step has been made by the Ancient Monuments Consolidation and Amendment Act passed last Session, which gives the Commissioners of Works certain much-needed powers to prevent acts of vandalism. We have given earnest thought to the constitution of the Advisory Boards for England, Scotland, and Wales, and these are now practically complete. I believe that when the names of the eminent men of all shades who have patriotically agreed to serve are published, as they will be at no distant date, these Boards will command universal confidence and respect ; and no nomination and acceptance has given me more personal pleasure than has that of your distinguished President. I have at my office three documents in my Department, which will ultimately be published, and which I think may be of interest to some of you. I shall be willing to show them to anyone anxious for information. The first is a Report on the use of limes and sands for pointing. We get enormous experience from the number of buildings we have to deal with. The second is general instructions which have been issued to foremen in charge of works of preservation. These will interest Mr. Forsyth, though perhaps he has already seen them. It shows the care with which each individual instruction is gone into before any foreman starts the work. The third is a Report upon the result of rough tests undertaken with various stone preservatives. The question of the treatment of decaying stone, due to the presence of sulphuric acid in the air, has given us, and still gives us, much anxiety. We have made numerous experiments, particularly in the Chapter House at Westminster, with baryta water and other ingredients, but, alas ! up to the present, with no satisfactory results. The decay of stone is a matter of such far-reaching importance, particularly in relation to the preservation of ancient monuments, that I have persuaded the Treasury to give me a grant of money for one, two, or three years, to institute a scientific inquiry, and I hope to obtain the eminent services of Professor Laurie, of the Heriot Watt College, Edinburgh, to this end. I have also moved the Foreign Office to inquire officially of the Governments of France, Germany, Italy, Greece, and America as to whether any scientist in those countries has ever evolved any treatment to combat this all-serious evil. I will conclude by moving that a warm expression of thanks be voted to Mr. Forsyth for his interesting Paper on this fascinating subject.

MR. THACKERAY TURNER, F.S.A. [*F.*]: It is difficult to say anything beyond thorough and strong praise of Mr. Forsyth's Paper. It is a difficult Paper to write, because of the extent of the subject, and it is difficult for me to speak upon. I think this most useful Paper ought to lead the way to a further study and consideration of the subject. Now that it is in the hands of a Government Department, we shall be treating it in a more serious and wider sense than in the past. To my mind, it has been perfectly shocking that any of our works of art, in the shape of ancient buildings, should have been at the mercy and opinion of any one person, whose whim was uncontrolled, except, perhaps, by a vicar and churchwardens. I am certain no building can be dealt with properly if it rests on the judgment of one man. Though I have formed my own opinion as to how a building should be treated, I have never for a moment thought of acting on that opinion without consulting many others to hear what they thought of my point of view. I think one of the strangest outcomes of my work as Secretary of the Society for the Protection of Ancient Build

ings, has been that whereas for twenty-eight or thirty years I, with the aid of my Committee, have been striving to get buildings properly repaired, we have been affecting for good modern architecture. I am sure that the method of properly repairing ancient buildings is one of the most instructive studies that men can enter upon to teach them modern building. I am perfectly certain—and I speak as a brother architect—that for a man to start practice straight away when he has attended the classes which are advocated nowadays, and gone into an architect's office, is a great misfortune. He labours at a disadvantage, because every builder can bowl him out over and over again upon practical questions; probably the very workman will know things which he does not. Because really an architect needs to know every trade which is employed in building; that is almost impossible for any man to know, and yet it is what is expected of an architect. So I would say that a young architect who has the chance of working at the repair of ancient buildings will be having the best training possible, not only in that particular work, but as fitting him better to carry out modern buildings. Since I have had more leisure and been able to live in the country, I, as an architect, have found it impossible to refrain from building. I did not wish to employ a builder, because the work would be done too quickly. So I got a man to come, and he worked under my direction; and I assure you that while one is living on the job one thinks of and sees things that one would not otherwise. And in times to come I think the architect will practise rather differently from what he has been used to in the past. As regards our present subject, why does my Society object to "Restoration"—i.e. the reproduction of ancient features? Why should it not be done? I discussed this question with a lady, but for a long time without making any impression on her. Then I said, "Suppose you went into Bond Street and bought a Paris hat, and the salesman sent you home a copy of it, would you be satisfied?" She said, "I should at once know that it was not the original, and I see what you mean." I told her that a work of art is a work of creation; you cannot have art without creation. But is a copy a creation? No. From having seen hundreds of restored churches, I say the more they are restored, the more sickening they are. To my mind, there is no interest in a traceried window which is a copy; it is deadly dull, and even offensive. If you admit that, you have got to face the matter of what must be done. In spite of the view of my friend Mr. Peers, I say it is of no use to replace ancient work by new work and imagine it is right. I know I am slightly misrepresenting him, but it comes to pretty much the same thing. I wish Mr. Forsyth had shown us a slide of St. John's garden front, Oxford, as repaired. You know the stone goes badly in Oxford. Some stones decay very slightly, others go a long way back. Mr. Peers said the right course was to put in new stone in place of decayed stone. If St. John's front struck any note in you as it originally was, I defy you to feel your senses stirred in like manner by the building if all the decayed stone had been replaced by new stone. If you are content to have an entirely new stone front there, well and good, if it satisfies you. But I do not think the world at large will be satisfied. If you find the stone has decayed for three or four inches, and you cut the rest of the stone out, you are injuring the wall unnecessarily, because within half an inch of where it is decayed you have sound stone. And why remove the sound stone? By cutting the decayed face back and building up with layers of tile, you are doing the least amount of destruction to the old wall, the least falsification, and the result is more harmonious: certainly you have better preserved the spirit of the building. Another point is, that if you are using tiles in this manner you have so many opportunities of wedging up open joints and beds and fissures in stone, and it is done quickly, and the process is cheaper than the other. Another thing is that if you have mortar which is more than $\frac{3}{4}$-inch thick, it will not make a hard-set mortar. But if you are working in the way I say, you drive your tile into the mortar, and that thins the mortar and wedges it up, and you produce a good result. Of course the tiles are laid horizontally just as bricks are used. It must not be forgotten that stone will decay, but tiles will not decay. I could speak on this subject for any length of time, but I will now conclude by seconding the vote of thanks to Mr. Forsyth for his excellent Paper.

THE CHAIRMAN, calling upon Sir Francis Fox, reminded the Meeting that Sir Francis was appearing before them for the first time as an Honorary Associate of the Institute.

SIR FRANCIS FOX, M.Inst.C.E. [*Hon.A.*]: At this late hour I must not keep you more than a minute or two. First of all, allow me to thank you sincerely for the honour you have conferred upon me, because I am one of the nine or ten engineers who have been enrolled Honorary Associates. It is an honour which I very much appreciate, especially as I think it is an expression of approval of the work which I have had to carry out. I would place on record, if it is not already in your papers, a word about grouting by pressure, which has been recently introduced. The great thing is not to put the cart before the horse. I have seen lamentable results of underpinning buildings before the superstructure has been strengthened. Therefore, the proper sequence of operations is, first of all, to timber the building up to prevent its actual collapse; secondly, to grout it up by blowing out the dust with high-pressure air, to blow out the rats' nests and the owls and the martins, and the mice and the spiders, and everything of

that kind, and wetting the work well. Then grout it up. And after that, if you wish to do so, underpin. I have found very often that if you grout the building, although it has a bad foundation, you will avoid the necessity of underpinning afterwards; you are distributing the weight of the building over a much greater area. A word about telltales. The material for making the telltales should be two parts of good Portland cement to one of fine plaster. On a certain building we have recently put 2,500 telltales, and 1,500 of them have cracked. I am told that the cracking is due to the drying of the cement. I would say it is nothing of the kind, because if there is a fracture running down a wall, and we put cement telltales across and they break, we put some cement telltales away from the crack on the solid stone, and in not one of those instances have they ruptured. Plaster of Paris I do not advise. It is said that it is dangerous to rely on a single man for this work. I agree, and therefore I think there is much to be said for the American system of always associating an architect and an engineer together in the carrying out of any great work. There are certain things which the engineer can do better than the architect, and there are things which can be better done by the architect than by the engineer. But together they make a very good pair.

MR. C. R. PEERS, F.S.A., Inspector of Ancient Monuments: I am delighted at this opportunity of saying a word, as I have had a long and interesting conversation all through the dinner time with Mr. Turner. We began by holding our own points of view, and we finished by holding them more strongly still. In spite of everything he said, I shall continue to be an entire heretic. I will begin at the beginning. We are considering here to-night the question of the repair of ancient buildings, and Mr. Forsyth has laid down certain fundamental principles. He said that there should be independent and sufficient repair. Of course, we can agree that any repair shall be sufficient, but that is only begging the question, because we have various ideas as to what sufficiency means. As to independence, I am afraid I do not agree. It is the last thing any repair should be. The harm which has been done in these matters in this country has been done by the independent repairer. You have seen a specimen of it in the case of the interesting Hertfordshire church. If we are to begin with fundamental principles we must begin in this way. Take an ancient building—whether in ruins or whether in use it does not matter. You must secure its permanent preservation as far as your skill and its materials will allow. There are two things to be considered. You must not impair the historic interest of the building; it must, as far as possible, tell you afterwards everything that it could tell you before. And you must also consider the æsthetic side; anything which you do to preserve the history must not permanently injure the appearance of the building—I say "permanently" advisedly. These are the respective provinces of the antiquary and the artist—or the architect, for artist and architect are one in this matter. When a building is in need of repair it is in a bad way, and something must be done to it. Anything which you do will, to a certain extent, destroy the building's history; it must do. An old building which has been neglected for years may be roofless, its joints will be bad, and you will have to take away the old decayed mortar and reset certain stones. In so far as you do that, you alter the character of the building. If you think that you should leave such a building alone until it tumbles down, well and good; we are not arguing on that side; we are speaking of preserving. And if our efforts seem to be brutal, we have to consider why we are making them. Various methods have been advocated to-night, and several of them I would have liked to speak about if there had been time. There is a great distinction between buildings which are still occupied and buildings which are ruins. Buildings which are in use are still adding to their history; they are alive. Buildings which are in ruin are dead; their history is ended. There is all the difference in the world in their treatment. When a building is a ruin, you must do your best to preserve all that is left of it by every means in your power—by pointing, and grouting. Your course in regard to this is clear. When, however, you come to a building which is being used as a dwelling-house, or a church, or whatever it is, you have a different set of problems. You have to perpetuate it as a living building, one adapted to the use of the present generation, but which has a history to be preserved. I should be the last to advocate the destruction of history, but a building which is still fulfilling a purpose has a right to add to its history so long as good and noble materials are used; it is sheer sentimentality to say it has not. Recently I went down to Tattershall, where Mr. Weir has done some good work in making the building habitable. He has re-roofed the castle and put in floors, and where the windows had lost their tracery he has put in new stone tracery; and he is right. People may say he is falsifying evidence, for a hundred years hence someone may say "Look at those fifteenth-century windows." But you cannot legislate for Tom Fool. If a man does not understand the difference between fifteenth-century and twentieth-century windows, it is his own look-out. Mr. Weir has used stone of lasting quality, and it is very good work and very beautiful. He has done one thing which I do not agree with, and that is that where he had to house certain saddle-bars in the broken stone jambs, he has made the jambs good in cement. Now what we do at present is nothing but a palliative. The great enemy which we have to fight is stone decay, and we do not know

how to fight it. Consequently, we put in new stone or cement; we do so because we cannot preserve the life of the old stone. When we know how to preserve stone, all these expedients will be unnecessary. In the case of St. John's, Oxford, Mr. Turner says we must not shock modern susceptibilities by putting in new stone in the old weathered front. But will you allow modern susceptibilities to stand in the way of use for future generations? In fifty years' time your new stone will look nearly as good as the other, and the building will still be a stone building, as it was meant to be; your cement and tiles will not improve in looks and will perpetuate no history whatever. You must be honest and courageous. You will find a lot of people ready to call you a vandal and to say that you are not worthy to touch these buildings; but you must risk that—it would be moral cowardice not to. Do not touch a single stone that you can help, but where there is decay which can no longer be safely let alone put materials back as far as you can in the way you found them. Take as an example Westminster Abbey; there is hardly a single original stone on the outside, but Westminster Abbey is still a stone building. If its past surveyors had held Mr. Turner's views, it would probably have been all tiles and cement by now. You will remember Augustus Cæsar's boast that he found Rome a city of brick and left it a city of marble. Mr. Turner's school would find London a city of stone and leave it a city of tiles and cement. Never use base materials if you can help it, and do not be afraid that your repairs will deceive future ages. Ancient repairs, done without afterthought or self-consciousness, do not mislead us to-day; our own repairs, honestly done, with the knowledge of the antiquary and in the spirit of the artist, will not destroy the history and meaning of a building for those who have eyes to see.

THE CHAIRMAN: I should like from the chair to tender the thanks of the Institute to Mr. Earle for his invitation to members to inspect the work being carried out by his Department. The privilege will be much appreciated by members. I am not prepared to add anything to the discussion myself, but I do not want to sit down without personally thanking Mr. Forsyth for his Paper. It is a matter of very great credit that he should have collected these photographs showing the condition of the old buildings and their appearance after restoration. One point I should like to mention is that when people have to carry out restorations on a building, it is not necessary that they should look at it from the æsthetic point of view entirely. Whatever has been put into a building is part of the history of the building, and in ninety-nine cases out of a hundred the history should be left intact. I have one striking example in my mind at present, in the chapel of one of our colleges, which some forty or fifty years ago was richly adorned with Grinling Gibbons panelling. Unfortunately, the eminent architect who was entrusted to carry out certain decorations destroyed the history of that chapel by removing this carving and putting in his own Gothic work instead. I do not care whether it is Grinling Gibbons or common work, it goes to make up the history of the building, and should be left alone in the interests of the building.

MR. FORSYTH, responding to the vote of thanks, said: My reply will be quite brief, and I will begin by expressing my sorrow that we do not part in any better agreement than I had foreseen. I was hoping that by starting a few of the hares to-night we might have caught some. The more we talk, the less we get towards the unification as to what is most desirable. We are all delighted to see Mr. Earle here; I think it a great honour to myself that he should be here to propose the vote of thanks. I was glad to hear him say his Department had had no protests; I can supply him with some, if he likes. (MR. EARLE: By all means send them along.) I am so interested in the work they are doing that I do not want to create disturbance in the Office of Works. I have made some criticisms to which one member in particular in the Office of Works has taken exception. It is not because I think there are no deficiencies in that Office; but I believe that for all these buildings, which were originally erected as separate buildings, with no connection with one another, to be put under a system of official repair will produce some unfortunate results, unless, as I hinted, we seize upon the right course now, and give them independent treatment. The building I referred to in France is St. Etienne, Beauvais. It is very interesting to learn that a change of ideas in regard to this matter is likely to arise in France. I cordially echo the words of our Chairman about the invitation of Mr. Earle to visit any buildings being repaired. We shall never arrive at an agreement on this matter until we see what other people are doing. Latterly the Office of Works has done splendid service. I have ventured to criticise, from time to time, some over-repairs which I have seen taking place, and I want to do it in as friendly a manner as possible; and any future remarks I may have to make I will in future submit to Mr. Earle. I have not seen the instructions which they issue to workmen; if we could have some on the Institute table it would be very useful. Mr. Turner raised a very good point in saying that all people who worked at ancient buildings were induced to produce better modern architecture. I will read a short paragraph which I received from a great church repairer, Mr. Gaymer, of North Walsham: "I do not know if I am right, but it seems to me before we repair we must enter into the spirit of that which has been decayed. And just as the artistic sense was expressed in the work, so in the same

sense will it be stirred in trying to lengthen the life of the work which if not repaired would be lost; and it is a stimulus to go and do likewise." We want to maintain that stimulus, and that is what Mr. Turner meant when he said that the experience on works of repair induced one to design good work. I referred in my Paper to independent treatment, and Mr. Peers has touched upon it. I meant all buildings were to have separate treatment; I did not hint by whom or for whom. Our Institute issues these regulations to architects, and the Office of Works issues regulations to builders, but I think they are not entirely applicable to all the works in this country. By "independent" I mean local, as much as separate. The only point on which I seriously disagree with the Office of Works is that they are inclined to anticipate repairs; and one of the cases which Mr. Lionel Earle mentioned was a case in point; it is not entirely in his Department—in fact, it was put into another Department. I saw some destruction going on at an ancient building. Some pointing which was sound was being cut out to grout a hollow wall. There had been settlements in these hollow walls, but they were quiescent, and no movement was taking place. I considered that the disturbance of that old pointing, which was sound, and the attempt to fill in the hollow places in the wall, was undesirable and unnecessary. Though Mr. Peers thinks the history of a ruin is ended, the æsthetic interest of it is not ended; as we both say, they want a handling distinct from that of an inhabited building. And while we are making confessions, I will return to the Office of Works. I have seen their repair of a ruin which has been soundly and thoroughly undertaken; in fact, it was too well done, because it looks like a new ruin. But I do not wish to discourage what they are doing in any way; I hope they will go on doing as they are. Mr. Peers had his fling at the tiles, and I must have my fling at the ruins. It is not so much whether we want to put tracery back to old windows, so long as we have the principle that all repairs shall be self-expressive. Tattershall has been mentioned, and I suggest that we invite Mr. Weir, or Lord Curzon himself, to give us an account of what has been done there.

MR. LAWRENCE WEAVER [*Hon. A.*] sends the following comments:—

(1) I am doubtful if a diocesan scheme for supervising the repair and alteration of churches would effect what Mr. Forsyth desires. The unit seems to be too small, and it is doubtful if each diocese would yield enough antiquaries of adequate experience to serve as an efficient advisory committee. While it may be true that the memorial character of structural alterations and decorative additions may sometimes impede repair, it often works the other way. There are many examples in which a bequest for memorial purposes of money for, say, an enlarged chancel, has brought about the destruction of old work and the substitution of new, which was not needed for the convenience of the congregation or the better ordering of worship.

(2) Mr. Forsyth did not mention that Mr. C. R. Peers, as the Inspector of Ancient Monuments, will be assisted from the 1st January next by three assistant inspectors, and the staff of H.M. Office of Works will therefore be far better able to cope with the increasing number of buildings coming into their charge.

(3) Mr. Forsyth pleads very rightly for a revision of the Institute's *Conservation of Ancient Monuments*, which is certainly out of date. He also refers to the revision now proceeding by the Society for the Protection of Ancient Buildings of its *Notes on the Repair of Buildings*. He expresses the hope that the latter will become a standard work. May I suggest that the Institute's Recommendations also should not fall short of the claim of being standard? Surely it will lead to confusion to have two standard publications! Would it not be possible for the Institute to propose to the S.P.A.B. a participation in their labours of revision so that a standard work upon repair might be issued jointly, and bear the *imprimatur* both of the Institute and of the Society?

(4) All antiquaries must find themselves in hearty agreement with Mr. Forsyth's claim that enlargements of fabrics shall be honest and not imitative. Archæology has become a fashion for amateurs. The zeal of the collector has extended from furniture not only to the features of rooms, such as mantelpieces, panelling, &c., but onwards to complete rooms. Only too often one finds historical houses to which complete rooms, snatched from another old house, have been added, and with such unpleasant skill that the forgery is revealed only by the distorted and unhistorical plan. This passion for the "faking" of buildings seems to have an element of vulgarity worse in its way than the destroying zeal of the Gothic Revival. The activities of the latter were at least obvious. The misplaced ingenuity of the latest methods are more dangerous, in that they poison the wells of architectural history.

## THE OUTLOOK OF ARCHITECTURE.

THE President of the Institute, in his Opening Address of 3rd November, published in the JOURNAL for 8th November, took "stock of the situation" in the modern practice of architecture in terms that call for careful consideration. Mr. Blomfield remarks with force on the necessary continuity of architectural development, and on the futility of attempts to create new styles by independent effort, or by sudden break with the past.

So far I am in hearty agreement. But three points in the Address seem to me open to question, and I venture briefly to discuss them.

Mr. Blomfield appears to hold that the architecture of the Renaissance is based on tradition reaching back to Classic times, that its forms are suited to modern needs, and that it manifests, in a pre-eminent degree, the qualities of rhythm and proportion. Therefore he maintains, as I understand him, that this architecture supplies the proper guiding principles for modern practice, and that architects should pull together in effort to re-establish these principles, which have, unhappily he thinks, been lost sight of since the eighteenth century.

But he holds, also, that mediæval art is not to be ignored, that "the wise artist has to note" the various phases of this art, and, "in spite of their different idioms, he may find a certain bond of kinship in their constant effort after simplicity of statement, and even the most ardent Classicist may learn a lesson from the elasticity and resourcefulness of Gothic."

Again, he holds that the modern architect must be modern, and must keep abreast of modern requirements and modern methods. The new uses of steel and concrete will, he thinks, materially modify architectural design, but this modification must work itself out naturally, and gradually, since no true developments can be brought about by sudden effort.

It appears to me that these several sources of influence are too diverse and discordant to work together in creative design. I do not see how the principles of the Renaissance, of the Middle Ages, and of the American skyscraper, can be reconciled so as to set modern architecture moving on consistent lines. I think that such a combination involves a good deal of that eclecticism which Mr. Blomfield particularly disavows, and from which architecture has so deplorably suffered in modern times.

Let us briefly consider these propositions in their order.

Mr. Blomfield commends "those who through good report and evil steadily pursued our national tradition of Classic architecture," and remarks that "no serious advance is to be made by turning our back on the immediate past." But if, on examination, it be found that the art of the immediate past has been off the track of both national and sound tradition, as it seems to me that it has, then clearly it behoves us to turn the back on it. I do not think it can be shown that the Neo-Classic architecture of England—the architecture of Whitehall, of St. Paul's Cathedral, of Greenwich Hospital, or of Somerset House—is based on national tradition, or that it is a "vernacular style." It appears to me that it marks a break with English tradition, that it is an exotic foreign to English ideas, and unsuited to English needs. If this be so, then certainly there can be no hopeful advance until our misdirected steps are retraced to the point where wandering began.

As to the question whether the architecture of the Renaissance is based on Classic tradition, ideas may differ according to what is understood by Classic. If we mean by Classic art the pure art of Greece, we must admit that a radical break with Classic tradition was made by the imperial Roman architects. For the order which the Greeks used structurally was employed by the Romans ornamentally, without structural function, and in such a way as to contradict the true Roman structural forms. The art of the Renaissance follows the imperial Roman art in its irrational combination of structural and ornamental elements; thus it manifests no continuity of principles from the Classic art of Greece. The architects of the Renaissance had no knowledge of Greek art. Their notions were derived from the ancient art of Rome, and it was this art only that they professed to revive. But the art of the Renaissance is not based even on Roman tradition. The Italian designers of the fifteenth and sixteenth centuries used the orders, indeed, in the superficial ornamental way of the Romans; but this is not enough to establish an architectural filiation. Mr. Blomfield has truly said that ornamental details do not constitute a style of architecture. He speaks of a generation of architects who have "grown up no longer content with odds and ends of detail, however picturesque, but anxious to get to the heart of things, and to grasp the informing spirit of Neo-Classic architecture;" and he explains that this informing spirit is found in "the technique of the art in its widest sense, not only in the nuances of detail, but in the larger aspects of planning and composition, rhythm and proportion." In so far as these larger aspects grow out of construction, there is little in the architecture of the Renaissance that can be traced back to imperial Roman art. Compare the dome of St. Peter's with that of the Pantheon, or compare St. Paul's Cathedral with the Basilica of Maxentius. In point of construction the Roman works are simple, straightforward, and safe, while those of the Renaissance are complex, tortuous, and insecure. It would be hard, in any form of building, to find any "successive steps of development of construction" leading from the Roman works to those of the Renaissance. The builders

of the Renaissance took little account of Roman principles of construction. What they saw in Roman art was superficial—the ornamental covering of misapplied orders, and other unessential details. As I have elsewhere said,* they were sculptors and painters, rather than constructors. In construction they based their practice on the mediæval traditions of Italy, but sought, at the same time, to realise ambitious schemes that sometimes led to the adoption of vicious methods for which no justification can be found in any tradition. No one will deny that the architecture of the e rly Renaissance manifests much beauty of rhythm and proportion; but in the later, or more distinctly Neo-Classic art, these qualities are of a mechanical sort based on artificial formulas.

Neither the architects of the Renaissance, nor those of modern times, appear enough to realise that the chief merit of Roman architecture lies in construction. The Roman uses of arch and vault opened a new path in construction, and the first true architectural development that followed appears in the noble Byzantine style—where the column, with its base and capital, is rationally transformed and adapted to an arched system of construction, as it never was by the Romans. Then, in fullness of time, when conditions had ripened in Western Europe, came the organic Romanesque that gave rise to the Gothic style. In logic of construction, and in ornament that does no violence to structural forms, these two styles agree with the classic Greek from which in other respects they are so widely different. Thus from the point of view of logic in design and construction, without which, it appears to me, no good architecture is possible, the true current of tradition runs along the path on which the Greek, the Byzantine, and the Gothic styles are the great landmarks.

As to mediæval art, I do not see what "lesson from the elasticity and resourcefulness of Gothic" can be found applicable to design on Neo-Classic principles. If modern design is to proceed on Neo-Classic lines it seems to me that the less the architect has to do with Gothic art the better.

I may say here that I think no better of the so-called Gothic Revival than Mr. Blomfield does. Good art never has been, and never can be, brought about by revival movements. Such art arises out of conditions that cannot be produced at will. The architecture of the Middle Ages is a natural expression of mediæval ideas, needs, and resources, and all effort to produce such architecture under other conditions must be futile. There may be mechanical copying of Gothic forms, but no living art can be retrospective. Any art of modern times that has any real kinship with Gothic will necessarily take a different form.

Mr. Blomfield remarks somewhat disparagingly on mediæval builders, asking if it be not an "historical fact that many of them built extremely badly," and saying of Beauvais that it "failed almost at once, and had to be precariously maintained by a network of iron bars." It is true that we have in the very exceptional choir of Beauvais a hazardous scheme owing to its exaggerated scale, and more particularly its immoderate altitude; and in carrying out this scheme there appears to have been some careless workmanship. Thus it was not long before signs of weakness appeared, and the system had to be strengthened, not by iron bars, but by the addition of intermediate piers, and intermediate transverse ribs—converting the original quadripartite vaulting into vaulting of sexpartite form. With this reinforcement the stupendous monument has come down to our day a magnificent example of structural skill, though not of that moderation that had characterised the previous French Gothic art. The inordinately tall buttresses have, as a measure of precaution, been steadied by a rod of iron connecting each outer member with the middle one corresponding to it, and this again with the pier buttress; and by a rod from one to another of the outer pinnacles. This hardly constitutes a "network of iron bars." It should be understood, too, that there is no strain on these rods. The stability of the structure does not depend on them, save in so far as they guard against chances of disturbance from exceptional causes—as sudden vibration in cases of earthquake.

Notwithstanding the folly of its builders in carrying the work so high, and such lack of thoroughness in execution as they may have been guilty of, the choir of Beauvais has stood now for the better part of a thousand years, and is, I believe, safe for a long time to come. There need not be much complaint on the score of insecurity in a building with such a record. As compared, in point of stability, with what has been regarded as the greatest architectural work of the Renaissance —the dome of St. Peter's—it is a monument of strength. The structural scheme of Beauvais is a sound one, while that of St. Peter's dome is one of inherent weakness. No excellence of workmanship could make such a thing safe. It depended from the first on embedded hoops of iron, on which the strains soon became so great that it appeared long ago that some of them had broken, and additional ones had to be applied on the outside in order to prevent collapse. The dome and its drum are now held together by numerous heavy rings and cramps of iron, on which the strains are enormous.* These facts have been overlooked by people who have spoken of inherent weakness in the Gothic system. There is no such weakness. The stability of a Gothic structure is maintained by a safe equilibrium of well-adjusted parts. Mr. Blomfield does not, it is true, affirm inherent weakness in

* *Character of Renaissance Architecture*, p. 6.

* Cf. my *Character of Renaissance Architecture*, pp. 59–63.

Gothic construction, he speaks only of bad building, but his remarks on Beauvais may seem to imply such weakness.

Touching new developments, Mr. Blomfield remarks: "The only effective source of development in architectural form must be new conditions of building," and the American skyscraper is, he thinks, "an example of a new form arising out of new necessities." As to what are called modern methods he says: "The question still remains how are we to deal with inventions such as reinforced concrete." But what are the new necessities that have given rise to the skyscraper, and what have the uses of reinforced concrete and steel construction to do with architecture? It appears to me that the skyscraper arises out of no necessities, save those of interest on investment, and that reinforced concrete and steel construction can have no place in architecture properly so called. These modern methods all pertain to the domain of engineering * in the service of an ignoble commercialism, and have been devised in the interests of haste and cheapness which such commercialism demands. I say *ignoble* commercialism, because I believe that no right commercial spirit would have that disregard for all that makes for civic well-being that is manifest in the skyscraper, which has so extensively disfigured the city of New York—a city almost unique in beauty of surroundings, that might have been made one of the most beautiful in the world. The owner of the skyscraper seeks the largest return on the smallest outlay. With the steel frame an enormous amount of space may be got on a very small plot of ground, with a minimum of expense, by carrying the building to an indefinite height which the modern lift makes it possible to reach in a few seconds of time. It may be said that the skyscraper has come to stay, and that steel and concrete cannot be eliminated from use in modern building. If that be so, let us not be deceived. It means that architecture is so far obsolete. Let things be called by their right names. If gigantic steel cages reaching into the clouds are a necessity of modern conditions, let them be built in their naked ugliness, with no pretences of architectural features in concrete hung on to them. They are not bettered by such extraneous adjuncts. Let the architect abdicate, and hand over building operations to the engineer, whom he is now obliged to employ. Let the cages be made as suitable for their purposes as may be, but let it be understood that the commercial barbarism out of which they arise can furnish no inspiration for noble art.

As to the duration of these steel structures, there is, I believe, grave reason for solicitude. I have heard an engineer remark that he looked for some collapses of them in the not distant future. We do not know, he said, "how long before the steel may get tired."

The application of steel and concrete to other forms of building, now so rapidly developing, is equally destructive of true architecture. For the simulated masonry construction with which the steel frame is masked makes the building a sham and a deceit, which violate every principle of both mechanical and artistic integrity. Let the architect realise that, if he would survive, his only way "to deal with" so called modern methods is to let them alone. Having broken with all noble traditions of architecture, there still lingers some tradition of good building. Let this be strenuously maintained, and by planning rationally to meet given needs—which, after all, are not very different from what they have always been—and, by excellence of straightforward construction in good materials, let modern architecture, to use Mr. Blomfield's happy phrase, find itself. It will do so if we have any sense of rhythm and proportion, and if we cultivate, in all natural ways, that sense of beauty which alone makes grateful to the eye the works of men's hands.

CHARLES H. MOORE [*Hon.A.*].

* I must define what I understand by engineering, because it appears to me that it has, of late, been to some extent confounded with architecture. Engineering, I conceive, is a purely mechanical art, based on exact science. Thus the modern engineer works from science. He calculates his stresses mathematically, and employs the least amount of material that will give mechanical stability. Practical utility is the sole end of his art. Architecture, on the other hand, is a fine art, and the architect, as an artist, works from feeling and imagination in obedience to laws of which he is largely unconscious, and which transcend human science. As a constructor he is guided by tradition, custom, and intuition. He is not too sparing in the use of materials, for he seeks to satisfy the eye, as well as to meet the exigencies of stability. The history of architecture abundantly shows that the architect requires little science in the modern sense. And, consistently with his training as an artist, it is impossible, as well as useless, for him to have the scientific equipment of the engineer.

## Books Received.

An Introduction to English Church Architecture, from the Eleventh to the Sixteenth Century. By Francis Bond, M.A., F.G.S., Hon.A.R.I.B.A. With 1400 Illustrations. 2 vols. 4o. 1913. Price £2 2*s.* net. [Humphry Milford, Oxford University Press, London.]

The Old Halls and Manor Houses of Yorkshire, with some Examples of other Houses. By Louis Ambler, F.R.I.B.A., Architect. Illustrated by 91 plates from photographs specially taken by Horace Dan, Architect, and others, with 20 Plates of Measured Drawings and numerous Illustrations in the text. 8o. Lond. 1913. Price 35*s.* net. [B. T Batsford, 94 High Holborn.]

Ancient Town Planning. By F. Haverfield. 8o. Oxford. 1913. 6*s.* net. [The Clarendon Press, Oxford.]

Valuations and Compensations. A Text-Book on the Practice of Valuing Property and on Compensations in relation thereto, for the use of Architects, Surveyors, and others. By Professor Banister Fletcher. Fourth edition. Revised, rewritten and greatly enlarged, with new chapters on the Finance Act, 1909, Valuation for Rating, Mortgage, &c. By Banister Flight Fletcher, F.R.I.B.A., and Herbert Phillips Fletcher, F.R.I.B.A. 8o. Lond. 1913. Price 7*s.* 6*d.* net. [B. T. Batsford, 94 High Holborn.]

Victoria and Albert Museum Catalogues. Department of Engraving, Illustration, and Design.—Old English Pattern Books of the Metal Trades: a Descriptive Catalogue of the Collection in the Museum. Illustrated. 8o. Lond. 1913. Price 6*d.* [His Majesty's Stationery Office.]

9 CONDUIT STREET, LONDON, W., 20*th December* 1913.

## REGISTRATION: PROPOSALS OF THE COUNCIL.

*To the Associates of the Royal Institute of British Architects,—*

We have arranged for an informal meeting of Associates to take place at No. 9 Conduit Street for an exchange of views relative to the Council's proposals now before members of the Royal Institute. The meeting will be held in the Great Gallery on Tuesday, 30th December, at 7.30 P.M., and all Associates interested in the question are cordially invited to be present.

ROBERT ATKINSON.
G. L. ELKINGTON.
K. GAMMELL.
EDWIN GUNN.
E. STANLEY HALL.

## CHRONICLE.

### The London Society's Prize: Design for Improved Entrances to Broad Walk, Kensington Gardens.

This prize (the Gold Medal of the Society and £15) is offered for the best design for the improvement of the North and South Entrances to the Broad Walk of Kensington Gardens, London.

The fullest liberty is offered to competitors with regard to the alteration of existing conditions and as to the nature of the architectural and garden treatment to be proposed. The extent to which the proposals shall apply is not limited, provided that in accordance with the promoters' intentions both entrances to the Broad Walk are dealt with. It is suggested that in any case the scheme should include handsome gates. Emblematical ideas might be embodied in the sculpture, etc., such as, for example, the Progress of Queen Victoria's Reign and the Peace of King Edward's.

*Drawings required.*

Block plan to Ordnance scale (88 feet to 1 inch).
Plans and elevations of north and south ends showing architectural features to $\frac{1}{8}$-inch scale.
One double elephant sheet of detail to $\frac{1}{2}$-inch scale.
At least one perspective sketch.

All Schemes to be eligible must be delivered on or before Wednesday, 11th March 1914, at the office of the Royal Institute, addressed to The Secretary R.I.B.A., 9 Conduit Street, Hanover Square, London, W. Each packet is to be clearly marked on the outside with the words "London Society's Prize," and the competitor's Motto must be legibly written on the outside of the packet at the right-hand lower angle.

All drawings submitted will be considered available for illustration in any publication, at the discretion of the Committee of the London Society.

Due care will be taken of all Drawings, but the London Society and the R.I.B.A. will not be responsible for any loss of or damage to them while they remain in the hands of the R.I.B.A.

Any drawings submitted by two or more competitors are not eligible for the Prize.

The award will be made at the request of the London Society by a committee appointed by the Council of the R.I.B.A.

Each set of drawings is to be submitted without the name of its author, but with a motto legibly marked on the right-hand lower angle of each mount, and is to be accompanied by a letter containing the competitor's name and address, which is to be enclosed in an envelope sealed with a blank seal, and having, on the outside, the name of the Prize competed for and the same Motto as that attached to the work submitted. The sealed envelope must be enclosed in another envelope and sent by post, directed to The Secretary R.I.B.A., No. 9 Conduit Street, Hanover Square, London, W.

The carriage of the drawings to and from the office of the Royal Institute, and all expenses incidental thereto, must be paid by the owners. Such drawings will be returned on application, on the production of a formal demand, but the Royal Institute will not incur any expense in returning them; but if no such application is made within a period to be specified at the close of the Exhibition they will be despatched to the owner's address at the owner's risk, carriage unpaid.

### Architecture and Sculpture and Town Planning.

Mr. Bertram Mackennal, the Australian sculptor, discussing the subject of "Sculpture from an Imperial Standpoint" at a dinner given in his honour at the Authors' Club last week, expressed himself very hopefully as to the future of the sister arts in Australia. The chief cities of the Commonwealth seem to be specially well favoured atmospherically. A statue, or rather a bronze statue, erected in Melbourne or Sydney, whatever its art value, gains in beauty year by year, the bronze developing a very beautiful patina, quite an antique green. In London we can never secure this result. If the sculptor managed to produce it in his studio, it would not last six months when placed out of doors in this climate. "I remember," said Mr. Mackennal, "during my boyhood in Melbourne, how the Public Gardens had some fine copies of the antique

statues placed wherever one would add to the beauty of the surroundings, and how delightful they were. The statues were only in plaster, painted. In those days I did not think it at all exceptional; now I know what a delightful climate it must be that would allow a plaster statue to stand in beauty for years outdoors. How very easy for such a country to make their gardens beautiful! We must have had some men in the early days who cared for art and loved the beautiful, otherwise these statues would not have occurred, and there is still good taste directing their efforts, for in the last few years they have removed all the fences and railings from the public parks and gardens, making these exquisite gardens part of the town, instead of treating the trees and shrubs as wild animals and putting them behind bars. Think of Hyde Park without a railing; perhaps your minds immediately conceive the park covered with the prostrate bodies of our London derelicts. But Melbourne and Sydney had the same problem to solve. The Domain in Sydney in the old days, and not long ago, was a dangerous place to go through late at night, owing to the bands of larrikins who infested this spot, but a few great lights and big main walks left them no corner to skulk in. They have gone, and the Domain belongs to the people, night as well as day. I feel certain that Australia will always produce artists. The climate will breed them; and I think an untamed country—where you can see Nature nude, not covered by the obliterating fingerprints of man—has a message for the soul ready to receive it. So it is my hope, as we develop, that we may raise men who will give us great thoughts and works, imbued with the instinct of a new people in a new land. We must build up a great and noble architecture before we can expect the sister arts to exist happily. It is architecture which creates the demand for other arts. And in this art we have not yet taken the right step. The climate should dictate the style of architecture, both in our dwelling-houses and public buildings. It is a country where you require shade. There is the finger pointing to the type and style required, but it is generally unheeded except by the placing of iron verandahs along some of the streets, which only succeed in making those streets hideous; they also attract the sun and hold the heat. We shall yet develop a school of architects born in the country who will design their buildings with colonnades and loggias, and I am sure there will be great introduction of colour. It must come, and will, when the native-born begins to ask himself—Why not? What a chance Australia has with her new capital! There never has been a greater opportunity. May it be conceived with beauty as well as usefulness! Sculpture in our times, and especially in this country, appears to me in the guise of a divorced woman. Right back in civilisation, and all through the centuries, she was the happy wife of Architecture, contented to adorn the one who supported her. I do not know who came in to spoil this perfect marriage, but I think it was due to the new great industries which grew up everywhere during the Victorian era, and the richer the world grew the less interest it took in sculpture. However, we see the result to-day, that an architect designs niches and pedestals on and about his buildings, and knows they will never be filled or occupied. Most of them were never intended to be otherwise than barren. Whenever I see these barren niches I always think the sculptor has a good case of breach of promise against the architect! May we sculptors in the future get heavy damages for this breach, or, happier still, a restitution of conjugal rights! I am glad to say that the Commonwealth of Australia intends to alter this state of affairs as far as their new building in the Strand is concerned. They have very generously voted the magnificent sum of £25,000 for the decoration of that building with mural paintings and sculpture, the work to be done by Australian artists, and I feel sure they will approach their task with full knowledge of the difficulties to be overcome and with great enthusiasm."

### Daylight Illumination.

A Paper dealing with Problems in Daylight Illumination, with special reference to School Planning, was read before the Illuminating Engineering Society last Tuesday by Mr. Percy J. Waldram. Present among the audience as delegates of the Institute were Messrs. Frederic R. Farrow and George Hornblower, respectively Chairman and Hon. Secretary of the Science Standing Committee. The illumination of buildings by natural light, as obtained by forming openings in the walls and ceilings of rooms, is an operation which so materially influences the structure and the subsequent utility and value of all buildings, to say nothing of the architectural and other amenities, that it is surprising, as Mr. Waldram remarked, that rules should not have been formulated to determine the width, height, and arrangement of glass area necessary to afford adequate illumination for any given size of room. It is strange too that there should be no recognised criterion as to what constitutes adequate illumination for schools, libraries, dwelling-houses, shops, &c. The good or bad lighting of a room depends simultaneously upon at least three conditions—*i.e.* (*a*) the extent or lighting value of the outside sky; (*b*) the height of window head; (*c*) the breadth and distribution of glass. The author submitted as a basic proposition that a certain height of window head is essential to the proper lighting of a given depth of a room, whilst a certain width and distribution of glass is similarly essential to the proper lighting of a given width of room, and that both depend upon the lighting value of the unobstructed sky enjoyed by the window, verti-

cally and laterally. The fallacies of the rough rule making the glass area a certain proportion of the floor area are now generally recognised. The most important point with regard to existing recommendations is the frequently recurring suggestion that a minimum of sky must be visible from every point of a class-room. Obviously, however, this is not essential to good lighting. No one could reasonably assert that English elementary school class-rooms, constructed under the rules of the Board of Education, in towns, with an angle of obstruction by surrounding buildings of 30°, are improperly lit. Yet in such rooms one can only see the sky at the back of the room by lying down on the floor, and in no class of building with vertical lights is it customary to have such large high windows as in elementary schools. The fact that this devitalises the result of such a large amount of Continental experimental research is regrettable, but facts must be faced. Speaking of the Standing Regulations of the Board of Education, Mr. Waldram said that these are most excellent, and the lighting which they secure in new schools is often all that could be desired. But they do not recognise in their sweeping denunciation of skylights that in spite of the danger of leaking, these are of enormous lighting value, and can, and do, form a most valuable means of curing at slight expense defects in lighting quite sufficiently atrocious to demand the closing of a school. The Regulations also do not differentiate between skylights and lanterns or high dormers; and the emphatic denunciation of front lights is also, to say the least, open to question, at least in cases where the cill is fairly high and the aspect is not sunny. In conclusion the author submitted that the subject is one in which study is hampered for lack of practical data, and that the task of acquiring such data, although involving time, trouble, and expense, is one which offers rich promise of results of considerable monetary, architectural, and medical value. The Paper and discussion, together with an Appendix prepared by Dr. James Kerr containing a short history of recent German work on the Natural Lighting of Schools, will be published in the January issue of the *Illuminating Engineer*.

### Building Activity in Sydney.

A Reuter telegram in the Engineering Supplement of *The Times* of the 18th inst. announces that the general prosperity and steady growth of New South Wales are strikingly demonstrated by the building operations in the metropolis. A sum of about £7,000,000 has been expended during the year on building, being an increase of £750,000 as compared with last year's figures. New buildings numbered 8,476, of which 200, including some very imposing structures, were in the city proper. There is an indication of still greater activity for next year.

### Fate of the First New York "Skyscraper."

Commenting on the fact that the Tower Building, in Lower Broadway, the first skyscraper to be erected in New York City, is soon to be pulled down to make way for a more modern structure, a writer in a recent issue of the *New York Times* says: "There is something pathetic as well as distinctly American in the fact that this building, though now only twenty-four years old and illustrating a method of construction that still passes as new, should have been condemned to destruction on the ground that owing to its antiquity all its tenants have left it." It is noted that while the structure was only 120 feet high, it was the first to receive the name of "skyscraper" in New York City.

### Architects' Registration.

In Mr. Hall's suggestions for the proposed new Charter [see his letter, JOURNAL, 6th December, pp. 103–4] the following corrections should be noted:—

Clause (1), p. 104, describing those who shall have the exclusive right to the title "Chartered Architect," should be amended in lines 8 to 10 so as to read: "all graduates in architecture of any university in the United Kingdom; all other architects who have been in practice fifteen years."

### Honours and Appointments.

Mr. Ernest Newton, A.R.A., *Vice-President*, has been appointed Assessor in the Competition for the new offices for the Board of Trade, in place of the late Mr. John Belcher.

Mr. Edwin T. Hall [*F.*] and Mr. G. Hastwell Grayson [*F.*] have been appointed by the Council as the R.I.B.A. delegates at the Congress of the Royal Sanitary Institute to be held at Blackpool from the 6th to the 11th July 1914.

Count Plunkett [*H.A.*] has been elected a member of the Société Archéologique de France, and a Fellow of Det Kongelige Nordiske Oldskrift-selskab" (the Royal Society of Northern Antiquaries) of Copenhagen.

## COMPETITIONS.

### Coventry Technical Institute.

Members and Licentiates of the Royal Institute of British Architects must not take part in the above Competition because the Conditions are not in accordance with the published Regulations of the Royal Institute for Architectural Competitions.

### School for Defective Children, Glake Hall, Durham.

Members and Licentiates are advised that the conditions of the above competition are not in accordance with the Institute Regulations, and the Competitions Committee are in correspondence with the promoters with a view to their amendment.

## THE EXAMINATIONS.

### The Final: Alternative Problems in Design.

*Instructions.*

1. The drawings, which should be on uniform sheets of paper of not less than Imperial size, must be sent to the Secretary of the Board of Architectural Education, Royal Institute of British Architects, 9 Conduit Street, W., on or before the dates specified below.

2. Each set of drawings must be signed by the author, AND HIS NAME AND ADDRESS, and the name of the school, if any, in which the drawings have been prepared, must be attached thereto.

3. All designs, whether done in a school or not, must be accompanied by a declaration from the Student that the design is his own work and that the drawings have been wholly executed by him. In the preparation of the design the Student may profit by advice.

4. Drawings for subjects (*a*) are to have the shadows projected at any angle of 45° in line, monochrome, or colour. Drawings in subjects (*b*) are to be finished as working drawings. Lettering on all drawings must be in a clear scholarly character.

*Subject XIII.*

(*a*) A large Fireplace in the Main Reception Room of a Town Hall.

*Drawings required.*—Detail drawings to ½-inch scale. Important details to 1-inch scale.

(*b*) A Single-Span Foot Bridge over a Stream 40 feet wide, in any material that the candidate may select.

*Drawings required.*—Detail drawings to ½-inch scale. Important details to 1-inch scale.

*Subject XIV.*

(*a*) Council Offices for a Small Town on an open Site. The cost of the building not to exceed £15,000.

*Drawings required.*—⅛-inch scale and ½-inch.

(*b*) Completion of a Tower by a Lead Spire. The tower is 24 feet square outside measurement, 60 feet high to top of parapet. (Cornice and parapet not existing, but to be provided.) There is a newel staircase in the centre of one side of the tower.

*Drawings required.*—⅛-inch scale and ½-inch.

*Subject XV.*

(*a*) A Museum (detached) in the Park of a Country Town. The cost of the building not to exceed £15,000.

*Drawings required.*—⅛-inch scale and ½-inch.

(*b*) An Open Timber Roof to a School Hall, span 45 feet. The Hall is 80 feet long. One bay only to be shown.

*Drawings required.*—½-inch and important details to 1-inch scale.

*Dates for Submission of Designs in* 1914.

| | Subject XIII. | Subject XIV. | Subject XV |
|---|---|---|---|
| United Kingdom | 28th Feb. | 30th April | 30th June |
| Johannesburg | 30th April | 30th June | 31st Aug. |
| Melbourne | 30th May | 31st July | 30th Sept |
| Sydney | 30th May | 31st July | 30th Sept. |
| Toronto | 31st March | 30th May | 31st July |

## MINUTES. IV.

At the Fourth General Meeting (Ordinary), held Monday, 15th December 1913, at 8 p.m.—Mr. George Hubbard, F.S.A., *Vice-President*, in the Chair; 30 Fellows (including 8 members of the Council), 40 Associates, 9 Licentiates, 2 Hon. Associates, and numerous visitors—the Minutes of the General Meeting (Business), held Monday, 1st December, having been published in the JOURNAL, were taken as read and signed as correct.

The following Members and Licentiates attending for the first time since their election were formally admitted by the Chairman, viz.: Leonard William Barnard, *Fellow*; John Charles Rogers and Geoffrey Ronald Gilbertson Topham, *Associates*; Frederick Arthur Huntley and Edward A. B. Hay, *Licentiates*; and Sir Francis Fox, M.Inst.C.E., *Hon. Associate*.

The Secretary announced that the following candidates, being found eligible and qualified according to the Charter and By-laws, had been nominated for election, viz.: As FELLOWS: David McLeod Craik [*A.* 1900], Ernest Outram Cummins* [*A.* 1895], Emanuel Vincent Harris [*A.* 1900], Henry James Wise [*A.* 1895]. As HON FELLOW: Viscount Milner, G.C.B.

On the motion of the Chairman, seconded by Mr. Wm. Woodward [*F.*], Chairman of the Finance Committee, it was

RESOLVED, that this Meeting hereby confirms the Resolution passed at the General Meeting of the 1st December, viz.:—

"That, pending the registration under the Land Transfer Acts of the title of the Institute to the freehold and leasehold properties now vested in the Architectural Union Company, Limited, or in the Liquidator thereof, the Council of the Institute be authorised to join with the said Liquidator or otherwise in giving to the present Mortgagees such security for the sum of £4,000 owing to them as they shall reasonably require. And on the said Liquidator transferring the said properties to the Institute, the Council be authorised to execute in favour of the present Mortgagees such Mortgage as the Council shall think fit to secure the repayment of the said sum of £4,000, with interest at the rate of 4 per cent. per annum, in substitution for the said existing Mortgage.

"And that the Council be authorised to execute a second charge over the said properties in favour of the Bankers of the Institute as security or part security for the Overdraft authorised by the Resolution passed and confirmed on the 13th day of March 1911 and the 27th day of March 1911."

Mr. W. A. Forsyth [*F.*] having read a Paper on THE REPAIR OF ANCIENT BUILDINGS, and shown a number of illustrative lantern-slides, the Paper was discussed, and, on the motion of Mr. Lionel Earle, C.B., Permanent Secretary of H.M. Office of Works, seconded by Mr. Thackeray Turner [*F.*], a vote of thanks was passed to the author by acclamation.

The proceedings terminated at 10.20 p.m.

* We deeply regret to announce that news has since been received of the death of Mr. Cummins.